The Parma Polyhedra Library Configured OCaml Language Interface User's Manual*
(version 0.11.2)

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http://www.cs.unipr.it/ppl/

Contents

1 OCaml Language Interface **1**

2 Module Ppl_ocaml **19**

3 GNU General Public License **466**

4 GNU Free Documentation License **475**

5 Module Index **480**

5.1 Modules 480

6 Module Documentation **481**

6.1 OCaml Language Interface 481

1 OCaml Language Interface

The Parma Polyhedra Library comes equipped with an interface for the OCaml language.

The main features of the library are described in Section OCaml Interface Features. Section OCamldoc Documentation lists all the functions available to the default generated domains in the OCaml interface. Section Compilation and Installation explains how the OCaml interface is compiled and installed.

In the sequel, `prefix` is the prefix under which you have installed the library (typically `/usr` or `/usr/local`).

OCaml Interface Features

The OCaml interface provides access to the numerical abstractions (convex polyhedra, BD shapes, octagonal shapes, etc.) implemented by the PPL library. A general introduction to the numerical abstractions, their representation in the PPL and the operations provided by the PPL is given in the main *PPL user manual*. Here we just describe those aspects that are specific to the OCaml interface.

Overview

First, here is a list of notes with general information and advice on the use of the OCaml interface.

- The numerical abstract domains available to the OCaml user consist of the *simple* domains, *powersets* of a simple domain and *products* of simple domains.
  - The simple domains are:
    - convex polyhedra, which consist of C_Polyhedron and NNC_Polyhedron;
    - weakly relational, which consist of BD_Shape_N and Octagonal_Shape_N where N is one of the numeric types short, signed_char, int, long, long_long, mpz_class, mpq_class;
    - boxes which consist of Int8_Box, Int16_Box, Int32_Box, Int64_Box, Uint8_Box, Uint16_Box, Uint32_Box, Uint64_Box, Double_Box, Long_Double_Box, Z_Box, Rational_Box, Float_Box; and
    - the Grid domain.
  - The powerset domains are Pointset_Powerset_S where S is a simple domain.
  - The product domains consist of Direct_Product_S_T, Smash_Product_S_T and Constraints_-Product_S_T where S and T are simple domains.
- In the following, any of the above numerical abstract domains is called a PPL *domain* and any element of a PPL domain is called a *PPL object*.
- The OCaml interface files are all installed in the directory `prefix/lib/ppl`. Since this includes shared and dynamically loaded libraries, you must make your dynamic linker/loader aware of this fact. If you use a GNU/Linux system, try the commands `man ld.so` and `man ldconfig` for more information.
- A PPL object such as a polyhedron can only be accessed by means of a OCaml term called a *handle*. Note, however, that the data structure of a handle, is implementation-dependent, system-dependent and version-dependent, and, for this reason, deliberately left unspecified. What we do guarantee is that the handle requires very little memory.
- An OCaml program can obtain a valid handle for a PPL object by using functions such as

  ```
  ppl_new_C_Polyhedron_from_space_dimension,
  ppl_new_C_Polyhedron_from_C_Polyhedron,
  ppl_new_C_Polyhedron_from_constraints,
  ppl_new_C_Polyhedron_from_generators.
  ```

  These functions will return a new handle for referencing a PPL polyhedron.
- For a PPL object with space dimension `k`, the identifiers used for the PPL variables must lie between 0 and $k-1$ and correspond to the indices of the associated Cartesian axes. For example, when using the functions that combine PPL polyhedra or add constraints or generators to a representation of a PPL polyhedron, the polyhedra referenced and any constraints or generators in the call should follow all the (space) dimension-compatibility rules stated in Section *Representations of Convex Polyhedra* of the main PPL user manual.

- As explained above, a polyhedron has a fixed topology C or NNC, that is determined at the time of its initialization. All subsequent operations on the polyhedron must respect all the topological compatibility rules stated in Section *Representations of Convex Polyhedra* of the main PPL user manual.
- Any application using the PPL should make sure that only the intended version(s) of the library are ever used. Functions

```
ppl_version_major,
ppl_version_minor,
ppl_version_revision,
ppl_version_beta,
ppl_version,
ppl_banner.
```

  allow run-time checking of information about the version being used.

Function Descriptions

Below is a short description of many of the interface functions. For full definitions of terminology used here, see the main PPL user manual.

Domain Independent Functions

First we describe some domain independent functions included with all instantiations of the OCaml interfaces.

`ppl_version_major`

Returns the major number of the PPL version.

`ppl_version_minor`

Returns the minor number of the PPL version.

`ppl_version_revision`

Returns the revision number of the PPL version.

`ppl_version_beta`

Returns the beta number of the PPL version.

`ppl_version`

Returns the PPL version.

ppl_banner

Returns information about the PPL version, the licensing, the lack of any warranty whatsoever, the C++ compiler used to build the library, where to report bugs and where to look for further information.

ppl_max_space_dimension

Returns the maximum space dimension the C++ interface can handle.

ppl_Coefficient_bits

Returns the number of bits used in the C++ interface for PPL coefficients; 0 if unbounded.

ppl_Coefficient_is_bounded

Returns true if and only if the coefficients in the C++ interface are bounded.

ppl_Coefficient_max

If the coefficients are bounded, returns the maximum coefficient the C++ interface can handle.

ppl_Coefficient_min

If the coefficients are bounded, returns the minimum coefficient the C++ interface can handle.

ppl_io_wrap_string source_string indent_depth preferred_first_line_length preferred_line_length

Utility function for the wrapping of lines of text. The function wraps the lines of text stored in its first string argument according to the next three integer arguments, which are interpreted as the indentation depth, the preferred length for the first line and the preferred length for all the other lines, respecively; it returns a string containing the wrapped text.

ppl_set_timeout hsecs

Computations taking exponential time will be interrupted some time after `hsecs` hundreths of seconds after that call. If the computation is interrupted that way, a timeout exception will be thrown. An exception is immediately thrown if `hsecs` is not strictly greater than zero, or if the PPL Watchdog library is not enabled.

ppl_reset_timeout

Resets the timeout time so that the computation is not interrupted. An exception is thrown if the PPL Watchdog library is not enabled.

ppl_set_deterministic_timeout weight

Computations taking exponential time will be interrupted some time after reaching the `weight` complexity threshold. If the computation is interrupted that way, a timeout exception will be thrown. An exception is immediately thrown if `hsecs` is not strictly greater than zero, or if the PPL Watchdog library is not enabled. *NOTE:* This "timeout" checking functionality is said to be *deterministic* because it is not based on actual elapsed time. Its behavior will only depend on (some of the) computations performed in the PPL library and it will be otherwise independent from the computation environment (CPU, operating system, compiler, etc.). The weight mechanism is under alpha testing: client applications should be ready to reconsider the tuning of these weight thresholds when upgrading to newer version of the PPL.

ppl_reset_deterministic_timeout

Resets the timeout time so that the computation is not interrupted. An exception is thrown if the PPL Watchdog library is not enabled.

ppl_set_rounding_for_PPL

Sets the FPU rounding mode so that the PPL abstractions based on floating point numbers work correctly. This is performed automatically at initialization-time. Calling this function is needed only if `restore_pre_PPL_rounding` has previously been called.

ppl_restore_pre_PPL_rounding

Sets the FPU rounding mode as it was before initialization of the PPL. After calling this function it is absolutely necessary to call `set_rounding_for_PPL` before using any PPL abstractions based on floating point numbers. This is performed automatically at finalization-time.

ppl_irrational_precision

Returns the precision parameter for irrational calculations.

ppl_set_irrational_precision

Sets the precision parameter `p` for irrational calculations. In the following irrational calculations returning an unbounded rational (e.g., when computing a square root), the lesser between numerator and denominator will be limited to `2**p`.

MIP Functions

Here we describe some functions available for PPL objects defining mixed integer (linear) programming problems.

ppl_new_MIP_Problem_from_space_dimension dimension

Return a handle to an MIP Problem MIP with the feasible region the vector space of dimension `dimension`, objective function 0 and optimization mode `max`.

ppl_new_MIP_Problem dimension constraint_system lin_expr optimization_mode

Return a handle to an MIP Problem MIP having space dimension `dimension`, a feasible region represented by `constraint_system`, objective function `lin_expr` and optimization mode `optimization_mode`.

ppl_MIP_Problem_get_control_parameter handle param_name

Returns the value of the control parameter named `param_name`.

ppl_MIP_Problem_set_control_parameter handle param_value

Sets control parameter value `param_value`.

ppl_MIP_Problem_swap handle_1 handle_2

Swaps the MIP Problem referenced by `handle_1` with the one referenced by `handle_2`.

ppl_MIP_Problem_space_dimension handle

Returns the dimension of the vector space in which the MIP Problem referenced by `handle` is embedded.

ppl_MIP_Problem_integer_space_dimensions handle

Returns a list of variables representing representing the integer space dimensions of the MIP Problem referenced by `handle`.

ppl_MIP_Problem_constraints handle

Returns a list of the constraints in the constraints system representing the feasible region for the MIP Problem referenced by `handle`.

ppl_MIP_Problem_objective_function handle

Returns the objective function for the MIP Problem referenced by `handle`.

ppl_MIP_Problem_optimization_mode handle

Returns the optimization mode for the MIP Problem referenced by `handle`.

ppl_MIP_Problem_clear handle

Resets the MIP problem referenced by `handle` to be the trivial problem with the feasible region the 0-dimensional universe, objective function 0 and optimization mode `Maximization`.

ppl_MIP_Problem_add_space_dimensions_and_embed handle dimension

Embeds the MIP problem referenced by `handle` in a space that is enlarged by `dimension` dimensions,

ppl_MIP_Problem_add_to_integer_space_dimensions handle vars_list

Updates the MIP Problem referenced by `handle` so that the variables in `vars_list` are added to the set of integer space dimensions.

ppl_MIP_Problem_add_constraint handle constraint

Updates the MIP Problem referenced by `handle` so that the feasible region is represented by the original constraint system together with the constraint `constraint`.

ppl_MIP_Problem_add_constraints handle constraint_system

Updates the MIP Problem referenced by `handle` so that the feasible region is represented by the original constraint system together with all the constraints in `constraint_system`.

ppl_MIP_Problem_set_objective_function handle lin_expr

Updates the MIP Problem referenced by `handle` so that the objective function is changed to `lin_expr`.

ppl_MIP_Problem_set_optimization_mode handle optimization_mode

Updates the MIP Problem referenced by `handle` so that the optimization mode is changed to `optimization_mode`.

ppl_MIP_Problem_is_satisfiable handle

Returns true if the MIP Problem referenced by `handle` is satisfiable and false otherwise.

ppl_MIP_Problem_solve handle

Solves the MIP problem referenced by `handle` and returns 0, if the MIP problem is not satisfiable; 1, if the MIP problem is satisfiable but there is no finite bound to the value of the objective function; 2, if the MIP problem admits an optimal solution.

ppl_MIP_Problem_feasible_point handle

Returns a feasible point for the MIP problem referenced by `handle`.

ppl_MIP_Problem_optimizing_point handle

Returns an optimizing point for the MIP problem referenced by `handle`.

ppl_MIP_Problem_optimal_value handle

Returns a pair of numbers, the first being the numerator and the second the denominator, for the optimal value for the MIP problem referenced by `handle`.

ppl_MIP_Problem_evaluate_objective_function handle generator

Evaluates the objective function of the MIP problem referenced by `handle` at point `generator`. Returns a pair of numbers, the first being the numerator and the second the denominator, for the objective function value for the MIP problem referenced by `handle`.

ppl_MIP_Problem_OK handle

Returns true if the MIP Problem referenced by `handle` is well formed, i.e., if it satisfies all its implementation invariants and false, otherwise. Useful for debugging purposes.

ppl_MIP_Problem_ascii_dump handle

Returns a string containing an ASCII dump of the internal representation of the MIP_Problem referenced by `handle`. Useful for debugging purposes.

PIP Functions

Here we describe some functions available for PPL objects defining parametric integer programming problems.

ppl_new_PIP_Problem_from_space_dimension dimension

Return a handle to a PIP Problem PIP with the feasible region the vector space of dimension `dimension`, empty constraint_system and empty set of parametric variables.

ppl_new_PIP_Problem dimension constraint_system vars_list

Return a handle to a PIP Problem PIP having space dimension `dimension`, a feasible region represented by `constraint_system` and parametric variables represented by `vars_list`.

ppl_PIP_Problem_get_control_parameter handle param_name

Returns the value of the control parameter named `param_name`.

ppl_PIP_Problem_set_control_parameter handle param_value

Sets control parameter value `param_value`.

ppl_PIP_Problem_swap handle_1 handle_2

Swaps the PIP Problem referenced by `handle_1` with the one referenced by `handle_2`.

ppl_PIP_Problem_space_dimension handle

Returns the dimension of the vector space in which the PIP Problem referenced by `handle` is embedded.

ppl_PIP_Problem_parameter_space_dimensions handle

Returns a list of variables representing representing the parameter space dimensions of the PIP Problem referenced by `handle`.

ppl_PIP_Problem_constraints handle

Returns a list of the constraints in the constraints system representing the feasible region for the PIP Problem referenced by `handle`.

ppl_PIP_Problem_clear handle

Resets the PIP problem referenced by `handle` to be the trivial problem with space dimension 0.

ppl_PIP_Problem_add_space_dimensions_and_embed handle dimension_0 dimension_1

Embeds the PIP problem referenced by `handle` in a space that is enlarged by `dimension_0` non-parameter dimensions and `dimension_1` parameter dimensions,

ppl_PIP_Problem_add_to_parameter_space_dimensions handle vars_list

Sets the space dimensions whose indexes are in `vars_list` to be parameter space dimensions.

ppl_PIP_Problem_add_constraint handle constraint

Updates the PIP Problem referenced by `handle` so that the feasible region is represented by the original constraint system together with the constraint `constraint`.

ppl_PIP_Problem_add_constraints handle constraint_system

Updates the PIP Problem referenced by `handle` so that the feasible region is represented by the original constraint system together with all the constraints in `constraint_system`.

ppl_PIP_Problem_set_big_parameter_dimension handle dimension

Sets the dimension for the big parameter to `dimension`.

ppl_PIP_Problem_get_big_parameter_dimension handle

Returns the dimension for the big parameter. Exception is thrown if no big parameter dimension has been set.

ppl_PIP_Problem_has_big_parameter_dimension handle

Returns true if and only if the dimension for the big parameter has been set.

ppl_PIP_Problem_is_satisfiable handle

Returns true if the PIP Problem referenced by `handle` is satisfiable and false otherwise.

ppl_PIP_Problem_solve handle

Solves the PIP problem referenced by `handle` and returns a status flag indicating the outcome of the optimization attempt: `Optimized_Pip_Problem` if the optimization attempt succeeds; `Unfeasible_Pip_Problem` otherwise.

ppl_PIP_Problem_solution handle

Solves the PIP problem referenced by `handle` and returns a handle to a PIP_Tree representing a feasible solution, if it exists and bottom otherwise.

ppl_PIP_Problem_optimizing_solution handle

Solves the PIP problem referenced by `handle` and returns a handle to a PIP_Tree representing an optimizing_solution, if it exists and bottom otherwise.

ppl_PIP_Problem_OK handle

Returns true if the PIP Problem referenced by `handle` is well formed, i.e., if it satisfies all its implementation invariants and false, otherwise. Useful for debugging purposes.

ppl_PIP_Problem_ascii_dump handle

Returns a string containing an ASCII dump of the internal representation of the PIP_Problem referenced by `handle`. Useful for debugging purposes.

ppl_PIP_Tree_Node_swap handle_1 handle_2

Swaps the PIP tree node referenced by `handle_1` with the one referenced by `handle_2`.

ppl_PIP_Tree_Node_OK handle

Returns true if the PIP tree node referenced by `handle` is well formed, i.e., if it satisfies all its implementation invariants and false, otherwise. Useful for debugging purposes.

ppl_PIP_Tree_Node_ascii_dump handle

Returns a string containing an ASCII dump of the internal representation of the Pip tree node referenced by `handle`. Useful for debugging purposes.

ppl_PIP_Tree_Node_constraints handle

Returns a list of the parameter constraints in the PIP tree node referenced by `handle`.

ppl_PIP_Tree_Node_artificials handle

Returns a list of the artificial parameters in the PIP tree node referenced by `handle`.

ppl_PIP_Tree_Node_is_bottom handle

Returns true if and only if `handle` represents bottom.

ppl_PIP_Tree_Node_is_decision handle

Returns true if and only if `handle` represents a decision node.

ppl_PIP_Tree_Node_is_solution handle

Returns true if and only if `handle` represents a solution node.

ppl_PIP_Tree_Node_parametric_values handle var

Returns a linear expression representing the values of problem variable `var` in the solution node represented by `handle`. The returned linear expression may involve problem parameters as well as artificial parameters.

ppl_PIP_Tree_Node_true_child handle var

Returns a handle to the child on the true branch of the PIP tree node represented by `handle`.

ppl_PIP_Tree_Node_false_child handle var

Returns a handle to the child on the false branch of the PIP tree node represented by `handle`.

C_Polyhedron Functions

Here we describe the main functions available for PPL objects defining convex and closed polyhedra.

ppl_new_C_Polyhedron_from_space_dimension space_dimension universe_or_empty

Returns a handle to a C polyhedron $\mathcal{P}$ with `space_dimension` dimensions; it is empty or the universe polyhedron depending on whether `universe_or_empty` is `empty` or `universe`, respectively.

ppl_new_C_Polyhedron_from_C_Polyhedron handle

If `handle` refers to a C polyhedron $\mathcal{P}_1$, then the expression will returns a handle to a copy $\mathcal{P}_2$ of $\mathcal{P}_1$.

ppl_new_C_Polyhedron_from_NNC_Polyhedron handle

If `handle` refers to an NNC polyhedron $\mathcal{P}_1$, then the expression returns a handle to a copy $\mathcal{P}_2$ of $\mathcal{P}_1$.

When using `ppl_new_C_Polyhedron_from_NNC_Polyhedron/2`, care must be taken that the source polyhedron referenced by `handle` is topologically closed.

ppl_new_C_Polyhedron_from_constraints constraint_system

Returns a handle to a C polyhedron $\mathcal{P}$ represented by `constraint_system`.

ppl_new_C_Polyhedron_from_generators generator_system

Returns a handle to a C polyhedron $\mathcal{P}$ represented by `generator_system`.

ppl_Polyhedron_swap handle_1 handle_2

Swaps the polyhedron $\mathcal{P}$ referenced by `handle_1` with the polyhedron $\mathcal{Q}$ referenced by `handle_2`. The polyhedra $\mathcal{P}$ and $\mathcal{Q}$ must have the same topology.

ppl_Polyhedron_space_dimension handle

Returns the dimension of the vector space in which the polyhedron referenced by `handle` is embedded.

ppl_Polyhedron_affine_dimension handle

Returns the actual dimension of the polyhedron referenced by `handle`.

ppl_Polyhedron_get_constraints handle

Return a list of the constraints in the constraints system representing the polyhedron referenced by `handle`.

ppl_Polyhedron_get_minimized_constraints handle

Returns a minimized list of the constraints in the constraints system representing the polyhedron referenced by `handle`.

ppl_Polyhedron_get_generators handle

Returns a list of the generators in the generators system representing the polyhedron referenced by `handle`.

ppl_Polyhedron_get_minimized_generators handle

Returns a minimized list of the generators in the generators system representing the polyhedron referenced by `handle`.

ppl_Polyhedron_relation_with_constraint handle constraint

Returns the list of relations the polyhedron referenced by `handle` has with `constraint`. The possible relations and their meaning is given in Section *Relation-With Operators* of the main PPL user manual.

ppl_Polyhedron_relation_with_generator handle generator

Returns the list of relations the polyhedron referenced by `handle` has with `generator`. The possible relations and their meaning is given in Section *Relation-With Operators* of the main PPL user manual.

ppl_Polyhedron_is_empty handle

Returns true if the polyhedron referenced by `handle` is empty and false, otherwise.

ppl_Polyhedron_is_universe handle

Returns true if the polyhedron referenced by `handle` is the universe and false, otherwise.

ppl_Polyhedron_is_bounded handle

Returns true if the polyhedron referenced by `handle` is bounded and false, otherwise.

ppl_Polyhedron_contains_integer_point handle

Returns true if the polyhedron referenced by `handle` contains at least one integer point and false, otherwise.

ppl_Polyhedron_bounds_from_above handle lin_expr

Returns true if the polyhedron referenced by `handle` is bounded from above by `lin_expr` and false, otherwise.

ppl_Polyhedron_bounds_from_below handle lin_expr

Returns true if the polyhedron referenced by `handle` is bounded from below by `lin_expr` and false, otherwise.

ppl_Polyhedron_maximize handle lin_expr

Returns a record `bool_1 * coefficient_1 * coefficient_2 * bool_2` where: `bool_1` is true if the polyhedron P referenced by `handle` is not empty and `lin_expr` is bounded from above in P and false, otherwise. `coefficient_1` is the numerator of the supremum value and `coefficient_2` the denominator of the supremum value. If the supremum is also the maximum, `bool_2` is true and false, otherwise.

ppl_Polyhedron_maximize_with_point handle lin_expr

Returns a record `bool_1 * coefficient_1 * coefficient_2 * bool_2 * Point` `bool_1` is true if the polyhedron P referenced by `handle` is not empty and `lin_expr` is bounded from above in P and false, otherwise. `coefficient_1` is the numerator of the supremum value and `coefficient_2` the denominator of the supremum value. If the supremum is also the maximum, `bool_2` is true and false, otherwise. `Point` is the point or closure point where `lin_expr` reaches the supremum.

ppl_Polyhedron_minimize handle lin_expr

Returns a record `bool_1 * coefficient_1 * coefficient_2 * bool_2` `bool_1` is true if the polyhedron P referenced by `handle` is not empty and `lin_expr` is bounded from below in P and false, otherwise. `coefficient_1` is the numerator of the infinum value and `coefficient_2` the denominator of the infinum value. If the infinum is also the minimum, `bool_2` is true and false, otherwise.

ppl_Polyhedron_minimize_with_point handle lin_expr

Returns a record `bool_1 * coefficient_1 * coefficient_2 * bool_2` `bool_1` is true if the polyhedron P referenced by `handle` is not empty and `lin_expr` is bounded from below in P and false, otherwise. `coefficient_1` is the numerator of the infinum value and `coefficient_2` the denominator of the infinum value. If the infinum is also the minimum, `bool_2` is true and false, otherwise. `Point` is the point or closure point where `lin_expr` reaches the infinum.

ppl_Polyhedron_is_topologically_closed handle

Returns true if the polyhedron referenced by `handle` is topologically closed and false, otherwise.

ppl_Polyhedron_contains_Polyhedron handle_1 handle_2

Returns true if the polyhedron referenced by `handle_2` is included in or equal to the polyhedron referenced by `handle_1` and false, otherwise.

ppl_Polyhedron_strictly_contains_Polyhedron handle_1 handle_2

Returns true if the polyhedron referenced by `handle_2` is included in but not equal to the polyhedron referenced by `handle_1` and false, otherwise.

ppl_Polyhedron_is_disjoint_from_Polyhedron handle_1 handle_2

Returns true if the polyhedron referenced by `handle_1` is disjoint from the polyhedron referenced by `handle_2` and false, otherwise.

ppl_Polyhedron_equals_Polyhedron handle_1 handle_2

Returns true if the polyhedron referenced by `handle_1` is equal to the polyhedron referenced by `handle_2` and false, otherwise.

ppl_Polyhedron_OK handle

Returns true if the polyhedron referenced by `handle` is well formed, i.e., if it satisfies all its implementation invariants and false, otherwise. Useful for debugging purposes.

ppl_Polyhedron_add_constraint handle constraint

Updates the polyhedron referenced by `handle` to one obtained by adding `constraint` to its constraint system.

ppl_Polyhedron_add_generator handle generator

Updates the polyhedron referenced by `handle` to one obtained by adding `generator` to its generator system.

ppl_Polyhedron_add_constraints handle constraint_system

Updates the polyhedron referenced by `handle` to one obtained by adding to its constraint system the constraints in `constraint_system`.

ppl_C_Polyhedron_add_generators handle generator_system

Updates the polyhedron referenced by `handle` to one obtained by adding to its generator system the generators in `generator_system`.

ppl_Polyhedron_intersection_assign handle_1 handle_2

Assigns to the polyhedron referenced by `handle_1` its intersection with the polyhedron referenced by `handle_2`.

ppl_Polyhedron_poly_hull_assign handle_1 handle_2

Assigns to the polyhedron referenced by `handle_1` its poly-hull with the polyhedron referenced by `handle_2`.

ppl_Polyhedron_poly_difference_assign handle_1 handle_2

Assigns to the polyhedron referenced by `handle_1` its poly-difference with the polyhedron referenced by `handle_2`.

ppl_Polyhedron_affine_image handle var lin_expr coefficient

Transforms the polyhedron referenced by `handle` assigning the affine expression `lin_expr/coefficient` to `var`.

ppl_Polyhedron_affine_preimage handle var lin_expr coefficient

This is the inverse transformation to that for `ppl_affine_image`.

ppl_Polyhedron_bounded_affine_image handle var lin_expr_1 lin_expr_2 coefficient

Transforms the polyhedron referenced by `handle` assigning the image with respect to the transfer relation `lin_expr_1/coefficient <= var <= lin_expr_2/coefficient`.

ppl_Polyhedron_generalized_affine_image handle var Relation_Symbol lin_expr coefficient

Transforms the polyhedron referenced by `handle` assigning the generalized affine image with respect to the transfer function `var Relation_Symbol lin_expr/coefficient`.

ppl_Polyhedron_generalized_affine_image_lhs_rhs handle lin_expr_1 Relation_Symbol lin_expr_2

Transforms the polyhedron referenced by `handle` assigning the generalized affine image with respect to the transfer function `lin_expr_1 Relation_Symbol lin_expr_2`.

ppl_Polyhedron_time_elapse_assign handle_1 handle_2

Assigns to the polyhedron $\mathcal{P}$ referenced by `handle_1` the time-elapse $(\mathcal{P} \nearrow \mathcal{Q})$ with the polyhedron $\mathcal{Q}$ referenced by `handle_2`.

ppl_Polyhedron_BHRZ03_widening_assign handle_1 handle_2

If the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, then `handle_1` will refer to the BHRZ03-widening of $\mathcal{P}_1$ with $\mathcal{P}_2$.

ppl_Polyhedron_BHRZ03_widening_assign_with_tokens handle_1 handle_2 c_unsigned_1

It is assumed that the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`; let $\mathcal{P}$ denote the BHRZ03-widening of $\mathcal{P}_1$ with $\mathcal{P}_2$, Assuming that the quantity t_1 given by `c_unsigned_1` is the number of tokens available, Then this function will return the number of tokens remaining at the end of the operation.

ppl_Polyhedron_limited_BHRZ03_extrapolation_assign handle_1 handle_2 constraint_system

If the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, then `handle_1` will refer to the BHRZ03-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$ improved by enforcing the constraints in `constraint_system`.

ppl_Polyhedron_limited_BHRZ03_extrapolation_assign_with_tokens handle_1 handle_2 constraint_system c_unsigned_1

It is assumed that the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`; let $\mathcal{P}$ denote the BHRZ03-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$, improved by enforcing those constraints in `constraint_system`.

Assuming that the quantity t_1 given by `c_unsigned_1` is the number of tokens available, then this function will return the number of tokens t_2 remaining at the end of the operation.

ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign handle_1 handle_2 constraint_system

If the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, then `handle_1` will refer to the BHRZ03-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$ improved by enforcing the constraints in `constraint_system` together with all constraints of the form $\pm x \leq r$ and $\pm x < r$ that are satisfied by every point in $\mathcal{P}_1$.

ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign_with_tokens handle_1 handle_2 constraint_system c_unsigned_1

It is assumed that the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`; let $\mathcal{P}$ denote the BHRZ03-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$ improved by enforcing those constraints in `constraint_system` together with all constraints of the form $\pm x \leq r$ and $\pm x < r$ that are satisfied by every point in $\mathcal{P}_1$.

Assuming that the quantity t_1 given by `c_unsigned_1` is the number of tokens available, this function will return the number of tokens t_2 remaining at the end of the operation.

ppl_Polyhedron_H79_widening_assign handle_1 handle_2

If the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, then `handle_1` will refer to the H79-widening of $\mathcal{P}_1$ with $\mathcal{P}_2$.

ppl_Polyhedron_H79_widening_assign_with_tokens handle_1 handle_2 c_unsigned_1

It is assumed that the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`; let $\mathcal{P}$ denote the H79-widening of $\mathcal{P}_1$ with $\mathcal{P}_2$, Assuming that the quantity t_1 given by `c_unsigned_1` is the number of tokens available, Then this function will return the number of tokens remaining at the end of the operation.

ppl_Polyhedron_limited_H79_extrapolation_assign handle_1 handle_2 constraint_system

If the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, then `handle_1` will refer to the H79-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$ improved by enforcing the constraints in `constraint_system`.

ppl_Polyhedron_limited_H79_extrapolation_assign_with_tokens handle_1 handle_2 constraint_system c_unsigned_1

It is assumed that the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`; let $\mathcal{P}$ denote the H79-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$, improved by enforcing those constraints in `constraint_system`.

Assuming that the quantity t_1 given by `c_unsigned_1` is the number of tokens available, then this function will return the number of tokens t_2 remaining at the end of the operation.

ppl_Polyhedron_bounded_H79_extrapolation_assign handle_1 handle_2 constraint_system

If the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, then `handle_1` will refer to the H79-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$ improved by enforcing the constraints in `constraint_system` together with all constraints of the form $\pm x \leq r$ and $\pm x < r$ that are satisfied by every point in $\mathcal{P}_1$.

ppl_Polyhedron_bounded_H79_extrapolation_assign_with_tokens handle_1 handle_2 constraint_system c_unsigned_1

It is assumed that the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`; let $\mathcal{P}$ denote the H79-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$, improved by enforcing those constraints in `constraint_system` together with all constraints of the form $\pm x \leq r$ and $\pm x < r$ that are satisfied by every point in $\mathcal{P}_1$.

Assuming that the quantity t_1 given by `c_unsigned_1` is the number of tokens available, this function will return the number of tokens t_2 remaining at the end of the operation.

ppl_Polyhedron_topological_closure_assign handle

Assigns to the polyhedron referenced by `handle` its topological closure.

ppl_Polyhedron_add_space_dimensions_and_embed handle space_dimension

Embeds the polyhedron referenced by `handle` in a space that is enlarged by `space_dimension` dimensions,

ppl_Polyhedron_concatenate_assign handle_1 handle_2

Updates the polyhedron $\mathcal{P}_1$ referenced by `handle_1` by first embedding $\mathcal{P}_1$ in a new space enlarged by the space dimensions of the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, and then adds to its system of constraints a renamed-apart version of the constraints of $\mathcal{P}_2$.

ppl_Polyhedron_add_space_dimensions_and_project handle space_dimension

Projects the polyhedron referenced by `handle` onto a space that is enlarged by `space_dimension` dimensions,

ppl_Polyhedron_remove_space_dimensions handle Int_List

Removes the space dimensions given by the identifiers of the PPL variables in list `Int_List` from the polyhedron referenced by `handle`. The identifiers for the remaining PPL variables are renumbered so that they are consecutive and the maximum index is less than the number of dimensions.

ppl_Polyhedron_remove_higher_space_dimensions handle space_dimension

Projects the polyhedron referenced to by `handle` onto the first `space_dimension` dimensions.

ppl_Polyhedron_expand_space_dimension handle var space_dimension

space_dimension copies of the space dimension referenced by variable var are added to the polyhedron referenced to by handle.

ppl_Polyhedron_fold_space_dimensions handle list_of_vars var

The space dimensions referenced by the PPL variables in list list_of_vars are folded into the dimension referenced by var and removed. The result is undefined if list_of_vars does not have the properties described in Section *Folding Multiple Dimensions of the Vector Space into One Dimension* of the main PPL user manual.

ppl_Polyhedron_map_space_dimensions handle p_func

Maps the space dimensions of the polyhedron referenced by handle using the partial function defined by a list of pairs of integers p_func. The result is undefined if p_func does not encode a partial function with the properties described in Section *Mapping the Dimensions of the Vector Space* of the main PPL user manual.

ppl_Polyhedron_wrap_assign handle list_of_vars width representation overflow constraint_system complexity_threshold wrap_indicator

Transforms the polyhedron referenced by handle by wrapping the dimensions given by list_of_vars while respecting the specified width, representation and overflow behavior of all these variables. The parameter constraint_system represents the conditional or looping construct guard with respect to which wrapping is performed. The non-negative integer complexity_threshold and Boolean wrap_indicator allow control of the complexity/precision ratio; higher values for complexity_threshold will lead to possibly greater precision while a true value for wrap_indicator indicates that the space dimensions should be wrapped individually. See Section *Wrapping Operator* for a more detailed description of this operator.

ppl_Polyhedron_ascii_dump handle

Returns a string containing an ASCII dump of the internal representation of the polyhedron referenced by handle. Useful for debugging purposes.

OCamldoc Documentation

NOTE: the complete documentation for module Ppl_ocaml, including all the types and functions that were enabled at configuration time, is only available in the *configuration dependent* OCamldoc documentation. The configuration independent OCamldoc documentation only contains those types and functions that are always enabled, which are grouped into module Ppl_ocaml_globals. Also note that module Ppl_ocaml automatically includes module Ppl_ocaml_globals.

2 Module Ppl_ocaml

```
exception PPL_arithmetic_overflow of string
```

```
exception PPL_timeout_exception
exception PPL_internal_error of string
exception PPL_unknown_standard_exception of string
exception PPL_unexpected_error of string
type degenerate_element =
  | Universe
  | Empty
type linear_expression =
  | Variable of int
  | Coefficient of Gmp.Z.t
  | Unary_Plus of linear_expression
  | Unary_Minus of linear_expression
  | Plus of linear_expression * linear_expression
  | Minus of linear_expression * linear_expression
  | Times of Gmp.Z.t * linear_expression
type linear_constraint =
  | Less_Than of linear_expression * linear_expression
  | Less_Or_Equal of linear_expression * linear_expression
  | Equal of linear_expression * linear_expression
  | Greater_Than of linear_expression * linear_expression
  | Greater_Or_Equal of linear_expression * linear_expression
type linear_generator =
  | Line of linear_expression
  | Ray of linear_expression
  | Point of linear_expression * Gmp.Z.t
  | Closure_Point of linear_expression * Gmp.Z.t
type linear_grid_generator =
  | Grid_Line of linear_expression
  | Grid_Parameter of linear_expression * Gmp.Z.t
  | Grid_Point of linear_expression * Gmp.Z.t
type poly_gen_relation =
  | Subsumes
type poly_con_relation =
  | Is_Disjoint
  | Strictly_Intersects
  | Is_Included
  | Saturates
type relation_with_congruence =
  | Is_Disjoint
  | Strictly_Intersects
  | Is_Included
type linear_congruence = linear_expression * linear_expression * Gmp.Z.t
type constraint_system = linear_constraint list
type generator_system = linear_generator list
type grid_generator_system = linear_grid_generator list
type congruence_system = linear_congruence list
type relation_symbol =
  | Less_Than_RS
  | Less_Or_Equal_RS
  | Equal_RS
```

```
  | Greater_Than_RS
  | Greater_Or_Equal_RS
type bounded_integer_type_overflow =
  | Overflow_Wraps
  | Overflow_Undefined
  | Overflow_Impossible
type bounded_integer_type_representation =
  | Unsigned
  | Signed_2_Complement
type bounded_integer_type_width =
  | Bits_8
  | Bits_16
  | Bits_32
  | Bits_64
  | Bits_128
type complexity_class =
  | Polynomial_Complexity
  | Simplex_Complexity
  | Any_Complexity
type optimization_mode =
  | Minimization
  | Maximization
type mip_problem_status =
  | Unfeasible_Mip_Problem
  | Unbounded_Mip_Problem
  | Optimized_Mip_Problem
type control_parameter_name =
  | Pricing
type control_parameter_value =
  | Pricing_Steepest_Edge_Float
  | Pricing_Steepest_Edge_Exact
  | Pricing_Textbook
type pip_problem_status =
  | Unfeasible_Pip_Problem
  | Optimized_Pip_Problem
type pip_problem_control_parameter_name =
  | Cutting_Strategy
  | Pivot_Row_Strategy
type pip_problem_control_parameter_value =
  | Cutting_Strategy_First
  | Cutting_Strategy_Deepest
  | Cutting_Strategy_All
  | Pivot_Row_Strategy_First
  | Pivot_Row_Strategy_Max_Column
val ppl_version_major : unit -> int
val ppl_version_minor : unit -> int
val ppl_version_revision : unit -> int
val ppl_version_beta : unit -> int
val ppl_version : unit -> string
val ppl_banner : unit -> string
```

```
val ppl_io_wrap_string : string -> int -> int -> int -> string
val ppl_max_space_dimension : unit -> int
val ppl_Coefficient_bits : unit -> int
val ppl_Coefficient_is_bounded : unit -> bool
val ppl_Coefficient_max : unit -> Gmp.Z.t
val ppl_Coefficient_min : unit -> Gmp.Z.t
val ppl_Linear_Expression_is_zero : linear_expression -> bool
val ppl_Linear_Expression_all_homogeneous_terms_are_zero :
  linear_expression -> bool
val ppl_set_rounding_for_PPL : unit -> unit
val ppl_restore_pre_PPL_rounding : unit -> unit
val ppl_irrational_precision : unit -> int
val ppl_set_irrational_precision : int -> unit
val ppl_set_timeout : int -> unit
val ppl_reset_timeout : unit -> unit
val ppl_set_deterministic_timeout : int -> unit
val ppl_reset_deterministic_timeout : unit -> unit
type mip_problem
val ppl_new_MIP_Problem_from_space_dimension : int -> mip_problem
val ppl_new_MIP_Problem :
  int ->
  constraint_system ->
  linear_expression ->
  optimization_mode -> mip_problem
val ppl_MIP_Problem_space_dimension : mip_problem -> int
val ppl_MIP_Problem_integer_space_dimensions : mip_problem -> int list
val ppl_MIP_Problem_constraints : mip_problem -> constraint_system
val ppl_MIP_Problem_add_space_dimensions_and_embed :
  mip_problem -> int -> unit
val ppl_MIP_Problem_add_to_integer_space_dimensions :
  mip_problem -> int list -> unit
val ppl_MIP_Problem_add_constraint : mip_problem -> linear_constraint -> unit
val ppl_MIP_Problem_add_constraints :
  mip_problem -> constraint_system -> unit
val ppl_MIP_Problem_set_objective_function :
  mip_problem -> linear_expression -> unit
val ppl_MIP_Problem_is_satisfiable : mip_problem -> bool
val ppl_MIP_Problem_solve : mip_problem -> mip_problem_status
val ppl_MIP_Problem_optimization_mode : mip_problem -> optimization_mode
val ppl_MIP_Problem_feasible_point : mip_problem -> linear_generator
val ppl_MIP_Problem_optimizing_point : mip_problem -> linear_generator
val ppl_MIP_Problem_objective_function : mip_problem -> linear_expression
val ppl_MIP_Problem_optimal_value : mip_problem -> Gmp.Z.t * Gmp.Z.t
val ppl_MIP_Problem_evaluate_objective_function :
  mip_problem -> linear_generator -> Gmp.Z.t * Gmp.Z.t
```

```
val ppl_MIP_Problem_OK : mip_problem -> bool
val ppl_MIP_Problem_clear : mip_problem -> unit
val ppl_MIP_Problem_set_optimization_mode :
  mip_problem -> optimization_mode -> unit
val ppl_MIP_Problem_set_control_parameter :
  mip_problem -> control_parameter_value -> unit
val ppl_MIP_Problem_get_control_parameter :
  mip_problem ->
  control_parameter_name -> control_parameter_value
val ppl_MIP_Problem_swap : mip_problem -> mip_problem -> unit
val ppl_MIP_Problem_ascii_dump : mip_problem -> string
type pip_problem
type pip_tree_node
type artificial_parameter = linear_expression * Gmp.Z.t
val ppl_new_PIP_Problem_from_space_dimension : int -> pip_problem
val ppl_new_PIP_Problem : int -> constraint_system -> int list -> pip_problem
val ppl_PIP_Problem_space_dimension : pip_problem -> int
val ppl_PIP_Problem_parameter_space_dimensions : pip_problem -> int list
val ppl_PIP_Problem_constraints : pip_problem -> constraint_system
val ppl_PIP_Problem_add_space_dimensions_and_embed :
  pip_problem -> int -> int -> unit
val ppl_PIP_Problem_add_to_parameter_space_dimensions :
  pip_problem -> int list -> unit
val ppl_PIP_Problem_add_constraint : pip_problem -> linear_constraint -> unit
val ppl_PIP_Problem_add_constraints :
  pip_problem -> constraint_system -> unit
val ppl_PIP_Problem_is_satisfiable : pip_problem -> bool
val ppl_PIP_Problem_solve : pip_problem -> pip_problem_status
val ppl_PIP_Problem_solution : pip_problem -> pip_tree_node
val ppl_PIP_Problem_optimizing_solution : pip_problem -> pip_tree_node
val ppl_PIP_Problem_get_big_parameter_dimension : pip_problem -> int
val ppl_PIP_Problem_set_big_parameter_dimension : pip_problem -> int -> unit
val ppl_PIP_Problem_has_big_parameter_dimension : pip_problem -> bool
val ppl_PIP_Problem_OK : pip_problem -> bool
val ppl_PIP_Problem_clear : pip_problem -> unit
val ppl_PIP_Problem_set_control_parameter :
  pip_problem ->
  pip_problem_control_parameter_value -> unit
val ppl_PIP_Problem_get_control_parameter :
  pip_problem ->
  pip_problem_control_parameter_name ->
  pip_problem_control_parameter_value
val ppl_PIP_Problem_swap : pip_problem -> pip_problem -> unit
val ppl_PIP_Problem_ascii_dump : pip_problem -> string
val ppl_PIP_Tree_Node_constraints : pip_tree_node -> constraint_system
val ppl_PIP_Tree_Node_artificials :
```

```
  pip_tree_node -> artificial_parameter list
val ppl_PIP_Tree_Node_ascii_dump : pip_tree_node -> string
val ppl_PIP_Tree_Node_OK : pip_tree_node -> bool
val ppl_PIP_Tree_Node_is_bottom : pip_tree_node -> bool
val ppl_PIP_Tree_Node_is_solution : pip_tree_node -> bool
val ppl_PIP_Tree_Node_parametric_values :
  pip_tree_node -> int -> linear_expression
val ppl_PIP_Tree_Node_is_decision : pip_tree_node -> bool
val ppl_PIP_Tree_Node_true_child : pip_tree_node -> pip_tree_node
val ppl_PIP_Tree_Node_false_child : pip_tree_node -> pip_tree_node
type int8_box
type int16_box
type int32_box
type int64_box
type uint8_box
type uint16_box
type uint32_box
type uint64_box
type z_box
type rational_box
type bd_shape_int8_t
type bd_shape_int16_t
type bd_shape_int32_t
type bd_shape_int64_t
type bd_shape_mpz_class
type bd_shape_mpq_class
type octagonal_shape_int8_t
type octagonal_shape_int16_t
type octagonal_shape_int32_t
type octagonal_shape_int64_t
type octagonal_shape_mpz_class
type octagonal_shape_mpq_class
type polyhedron
type grid
type pointset_powerset_int8_box
type pointset_powerset_int16_box
type pointset_powerset_int32_box
type pointset_powerset_int64_box
type pointset_powerset_uint8_box
type pointset_powerset_uint16_box
type pointset_powerset_uint32_box
type pointset_powerset_uint64_box
type pointset_powerset_rational_box
type pointset_powerset_z_box
```

```
type pointset_powerset_bd_shape_int8_t
type pointset_powerset_bd_shape_int16_t
type pointset_powerset_bd_shape_int32_t
type pointset_powerset_bd_shape_int64_t
type pointset_powerset_bd_shape_mpq_class
type pointset_powerset_bd_shape_mpz_class
type pointset_powerset_octagonal_shape_int8_t
type pointset_powerset_octagonal_shape_int16_t
type pointset_powerset_octagonal_shape_int32_t
type pointset_powerset_octagonal_shape_int64_t
type pointset_powerset_octagonal_shape_mpq_class
type pointset_powerset_octagonal_shape_mpz_class
type pointset_powerset_c_polyhedron
type pointset_powerset_nnc_polyhedron
type pointset_powerset_grid
type constraints_product_c_polyhedron_grid
type constraints_product_nnc_polyhedron_grid
type constraints_product_grid_c_polyhedron
type constraints_product_grid_nnc_polyhedron
type float_box
type bd_shape_float
type octagonal_shape_float
type pointset_powerset_float_box
type pointset_powerset_bd_shape_float
type pointset_powerset_octagonal_shape_float
type double_box
type bd_shape_double
type octagonal_shape_double
type pointset_powerset_double_box
type pointset_powerset_bd_shape_double
type pointset_powerset_octagonal_shape_double
type long_double_box
type bd_shape_long_double
type octagonal_shape_long_double
type pointset_powerset_long_double_box
type pointset_powerset_bd_shape_long_double
type pointset_powerset_octagonal_shape_long_double
val ppl_new_Int8_Box_from_space_dimension :
  int -> degenerate_element -> int8_box
val ppl_new_Int8_Box_from_Int8_Box : int8_box -> int8_box
val ppl_new_Int8_Box_from_Int16_Box : int16_box -> int8_box
val ppl_new_Int8_Box_from_Int32_Box : int32_box -> int8_box
val ppl_new_Int8_Box_from_Int64_Box : int64_box -> int8_box
val ppl_new_Int8_Box_from_Uint8_Box : uint8_box -> int8_box
```

```
val ppl_new_Int8_Box_from_Uint16_Box : uint16_box -> int8_box
val ppl_new_Int8_Box_from_Uint32_Box : uint32_box -> int8_box
val ppl_new_Int8_Box_from_Uint64_Box : uint64_box -> int8_box
val ppl_new_Int8_Box_from_Z_Box : z_box -> int8_box
val ppl_new_Int8_Box_from_Rational_Box : rational_box -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_mpz_class : bd_shape_mpz_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_mpq_class : bd_shape_mpq_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> int8_box
val ppl_new_Int8_Box_from_C_Polyhedron : polyhedron -> int8_box
val ppl_new_Int8_Box_from_NNC_Polyhedron : polyhedron -> int8_box
val ppl_new_Int8_Box_from_Grid : grid -> int8_box
val ppl_new_Int8_Box_from_Float_Box : float_box -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_float : bd_shape_float -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> int8_box
val ppl_new_Int8_Box_from_Double_Box : double_box -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_double : bd_shape_double -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> int8_box
val ppl_new_Int8_Box_from_Long_Double_Box : long_double_box -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> int8_box
val ppl_new_Int8_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Int64_Box_with_complexity :
```

```
  int64_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_C_Polyhedron_with_complexity :
```

```
  polyhedron -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Grid_with_complexity :
  grid -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Long_Double_Box_with_complexity :
  long_double_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_constraints : constraint_system -> int8_box
val ppl_new_Int8_Box_from_congruences : congruence_system -> int8_box
val ppl_new_Int8_Box_from_generators : generator_system -> int8_box
val ppl_Int8_Box_swap : int8_box -> int8_box -> unit
val ppl_Int8_Box_space_dimension : int8_box -> int
val ppl_Int8_Box_affine_dimension : int8_box -> int
val ppl_Int8_Box_relation_with_constraint :
  int8_box ->
  linear_constraint -> poly_con_relation list
val ppl_Int8_Box_relation_with_generator :
  int8_box ->
  linear_generator -> poly_gen_relation list
val ppl_Int8_Box_relation_with_congruence :
  int8_box ->
  linear_congruence -> poly_con_relation list
val ppl_Int8_Box_get_constraints : int8_box -> constraint_system
val ppl_Int8_Box_get_congruences : int8_box -> congruence_system
val ppl_Int8_Box_get_minimized_constraints : int8_box -> constraint_system
val ppl_Int8_Box_get_minimized_congruences : int8_box -> congruence_system
val ppl_Int8_Box_is_empty : int8_box -> bool
val ppl_Int8_Box_is_universe : int8_box -> bool
```

```
val ppl_Int8_Box_is_bounded : int8_box -> bool
val ppl_Int8_Box_contains_integer_point : int8_box -> bool
val ppl_Int8_Box_is_topologically_closed : int8_box -> bool
val ppl_Int8_Box_is_discrete : int8_box -> bool
val ppl_Int8_Box_topological_closure_assign : int8_box -> unit
val ppl_Int8_Box_bounds_from_above : int8_box -> linear_expression -> bool
val ppl_Int8_Box_bounds_from_below : int8_box -> linear_expression -> bool
val ppl_Int8_Box_maximize :
  int8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int8_Box_minimize :
  int8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int8_Box_maximize_with_point :
  int8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int8_Box_minimize_with_point :
  int8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int8_Box_frequency :
  int8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Int8_Box_contains_Int8_Box : int8_box -> int8_box -> bool
val ppl_Int8_Box_strictly_contains_Int8_Box : int8_box -> int8_box -> bool
val ppl_Int8_Box_is_disjoint_from_Int8_Box : int8_box -> int8_box -> bool
val ppl_Int8_Box_equals_Int8_Box : int8_box -> int8_box -> bool
val ppl_Int8_Box_OK : int8_box -> bool
val ppl_Int8_Box_add_constraint : int8_box -> linear_constraint -> unit
val ppl_Int8_Box_add_congruence : int8_box -> linear_congruence -> unit
val ppl_Int8_Box_add_constraints : int8_box -> constraint_system -> unit
val ppl_Int8_Box_add_congruences : int8_box -> congruence_system -> unit
val ppl_Int8_Box_refine_with_constraint :
  int8_box -> linear_constraint -> unit
val ppl_Int8_Box_refine_with_congruence :
  int8_box -> linear_congruence -> unit
val ppl_Int8_Box_refine_with_constraints :
  int8_box -> constraint_system -> unit
val ppl_Int8_Box_refine_with_congruences :
  int8_box -> congruence_system -> unit
val ppl_Int8_Box_intersection_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_upper_bound_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_difference_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_concatenate_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_time_elapse_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_upper_bound_assign_if_exact : int8_box -> int8_box -> bool
```

```
val ppl_Int8_Box_simplify_using_context_assign : int8_box -> int8_box -> bool
val ppl_Int8_Box_constrains : int8_box -> int -> bool
val ppl_Int8_Box_unconstrain_space_dimension : int8_box -> int -> unit
val ppl_Int8_Box_unconstrain_space_dimensions : int8_box -> int list -> unit
val ppl_Int8_Box_affine_image :
  int8_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int8_Box_affine_preimage :
  int8_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int8_Box_bounded_affine_image :
  int8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int8_Box_bounded_affine_preimage :
  int8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int8_Box_generalized_affine_image :
  int8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int8_Box_generalized_affine_preimage :
  int8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int8_Box_generalized_affine_image_lhs_rhs :
  int8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int8_Box_generalized_affine_preimage_lhs_rhs :
  int8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int8_Box_add_space_dimensions_and_embed : int8_box -> int -> unit
val ppl_Int8_Box_add_space_dimensions_and_project : int8_box -> int -> unit
val ppl_Int8_Box_remove_space_dimensions : int8_box -> int list -> unit
val ppl_Int8_Box_remove_higher_space_dimensions : int8_box -> int -> unit
val ppl_Int8_Box_expand_space_dimension : int8_box -> int -> int -> unit
val ppl_Int8_Box_fold_space_dimensions : int8_box -> int list -> int -> unit
val ppl_Int8_Box_map_space_dimensions : int8_box -> (int * int) list -> unit
val ppl_Int8_Box_drop_some_non_integer_points :
  int8_box -> complexity_class -> unit
val ppl_Int8_Box_drop_some_non_integer_points_2 :
  int8_box -> int list -> complexity_class -> unit
val ppl_Int8_Box_ascii_dump : int8_box -> string
val ppl_Int8_Box_external_memory_in_bytes : int8_box -> int
val ppl_Int8_Box_total_memory_in_bytes : int8_box -> int
val ppl_Int8_Box_CC76_widening_assign_with_tokens :
  int8_box -> int8_box -> int -> int
```

```
val ppl_Int8_Box_CC76_widening_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_widening_assign_with_tokens :
  int8_box -> int8_box -> int -> int
val ppl_Int8_Box_widening_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_limited_CC76_extrapolation_assign_with_tokens :
  int8_box ->
  int8_box -> constraint_system -> int -> int
val ppl_Int8_Box_limited_CC76_extrapolation_assign :
  int8_box ->
  int8_box -> constraint_system -> unit
val ppl_Int8_Box_linear_partition :
  int8_box ->
  int8_box ->
  int8_box * pointset_powerset_nnc_polyhedron
val ppl_Int8_Box_wrap_assign :
  int8_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Int8_Box : int8_box -> bool
val ppl_termination_test_PR_Int8_Box : int8_box -> bool
val ppl_one_affine_ranking_function_MS_Int8_Box :
  int8_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int8_Box :
  int8_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int8_Box : int8_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int8_Box : int8_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int8_Box :
  int8_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Int8_Box_2 : int8_box -> int8_box -> bool
val ppl_termination_test_PR_Int8_Box_2 : int8_box -> int8_box -> bool
val ppl_one_affine_ranking_function_MS_Int8_Box_2 :
  int8_box -> int8_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int8_Box_2 :
  int8_box -> int8_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int8_Box_2 :
  int8_box -> int8_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int8_Box_2 :
  int8_box -> int8_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int8_Box_2 :
  int8_box ->
  int8_box -> polyhedron * polyhedron
val ppl_new_Int16_Box_from_space_dimension :
  int -> degenerate_element -> int16_box
val ppl_new_Int16_Box_from_Int8_Box : int8_box -> int16_box
val ppl_new_Int16_Box_from_Int16_Box : int16_box -> int16_box
```

```
val ppl_new_Int16_Box_from_Int32_Box : int32_box -> int16_box
val ppl_new_Int16_Box_from_Int64_Box : int64_box -> int16_box
val ppl_new_Int16_Box_from_Uint8_Box : uint8_box -> int16_box
val ppl_new_Int16_Box_from_Uint16_Box : uint16_box -> int16_box
val ppl_new_Int16_Box_from_Uint32_Box : uint32_box -> int16_box
val ppl_new_Int16_Box_from_Uint64_Box : uint64_box -> int16_box
val ppl_new_Int16_Box_from_Z_Box : z_box -> int16_box
val ppl_new_Int16_Box_from_Rational_Box : rational_box -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> int16_box
val ppl_new_Int16_Box_from_C_Polyhedron : polyhedron -> int16_box
val ppl_new_Int16_Box_from_NNC_Polyhedron : polyhedron -> int16_box
val ppl_new_Int16_Box_from_Grid : grid -> int16_box
val ppl_new_Int16_Box_from_Float_Box : float_box -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_float : bd_shape_float -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> int16_box
val ppl_new_Int16_Box_from_Double_Box : double_box -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_double : bd_shape_double -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> int16_box
val ppl_new_Int16_Box_from_Long_Double_Box : long_double_box -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> int16_box
val ppl_new_Int16_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> int16_box
```

```
val ppl_new_Int16_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_mpz_class_with_complexity :
```

```
  octagonal_shape_mpz_class ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Grid_with_complexity :
  grid -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_constraints : constraint_system -> int16_box
val ppl_new_Int16_Box_from_congruences : congruence_system -> int16_box
val ppl_new_Int16_Box_from_generators : generator_system -> int16_box
val ppl_Int16_Box_swap : int16_box -> int16_box -> unit
val ppl_Int16_Box_space_dimension : int16_box -> int
val ppl_Int16_Box_affine_dimension : int16_box -> int
val ppl_Int16_Box_relation_with_constraint :
  int16_box ->
  linear_constraint -> poly_con_relation list
val ppl_Int16_Box_relation_with_generator :
  int16_box ->
  linear_generator -> poly_gen_relation list
val ppl_Int16_Box_relation_with_congruence :
  int16_box ->
```

```
  linear_congruence -> poly_con_relation list
val ppl_Int16_Box_get_constraints : int16_box -> constraint_system
val ppl_Int16_Box_get_congruences : int16_box -> congruence_system
val ppl_Int16_Box_get_minimized_constraints : int16_box -> constraint_system
val ppl_Int16_Box_get_minimized_congruences : int16_box -> congruence_system
val ppl_Int16_Box_is_empty : int16_box -> bool
val ppl_Int16_Box_is_universe : int16_box -> bool
val ppl_Int16_Box_is_bounded : int16_box -> bool
val ppl_Int16_Box_contains_integer_point : int16_box -> bool
val ppl_Int16_Box_is_topologically_closed : int16_box -> bool
val ppl_Int16_Box_is_discrete : int16_box -> bool
val ppl_Int16_Box_topological_closure_assign : int16_box -> unit
val ppl_Int16_Box_bounds_from_above : int16_box -> linear_expression -> bool
val ppl_Int16_Box_bounds_from_below : int16_box -> linear_expression -> bool
val ppl_Int16_Box_maximize :
  int16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int16_Box_minimize :
  int16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int16_Box_maximize_with_point :
  int16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int16_Box_minimize_with_point :
  int16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int16_Box_frequency :
  int16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Int16_Box_contains_Int16_Box : int16_box -> int16_box -> bool
val ppl_Int16_Box_strictly_contains_Int16_Box :
  int16_box -> int16_box -> bool
val ppl_Int16_Box_is_disjoint_from_Int16_Box : int16_box -> int16_box -> bool
val ppl_Int16_Box_equals_Int16_Box : int16_box -> int16_box -> bool
val ppl_Int16_Box_OK : int16_box -> bool
val ppl_Int16_Box_add_constraint : int16_box -> linear_constraint -> unit
val ppl_Int16_Box_add_congruence : int16_box -> linear_congruence -> unit
val ppl_Int16_Box_add_constraints : int16_box -> constraint_system -> unit
val ppl_Int16_Box_add_congruences : int16_box -> congruence_system -> unit
val ppl_Int16_Box_refine_with_constraint :
  int16_box -> linear_constraint -> unit
val ppl_Int16_Box_refine_with_congruence :
  int16_box -> linear_congruence -> unit
val ppl_Int16_Box_refine_with_constraints :
  int16_box -> constraint_system -> unit
```

```
val ppl_Int16_Box_refine_with_congruences :
  int16_box -> congruence_system -> unit
val ppl_Int16_Box_intersection_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_upper_bound_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_difference_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_concatenate_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_time_elapse_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_upper_bound_assign_if_exact :
  int16_box -> int16_box -> bool
val ppl_Int16_Box_simplify_using_context_assign :
  int16_box -> int16_box -> bool
val ppl_Int16_Box_constrains : int16_box -> int -> bool
val ppl_Int16_Box_unconstrain_space_dimension : int16_box -> int -> unit
val ppl_Int16_Box_unconstrain_space_dimensions :
  int16_box -> int list -> unit
val ppl_Int16_Box_affine_image :
  int16_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int16_Box_affine_preimage :
  int16_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int16_Box_bounded_affine_image :
  int16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int16_Box_bounded_affine_preimage :
  int16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int16_Box_generalized_affine_image :
  int16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int16_Box_generalized_affine_preimage :
  int16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int16_Box_generalized_affine_image_lhs_rhs :
  int16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int16_Box_generalized_affine_preimage_lhs_rhs :
  int16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int16_Box_add_space_dimensions_and_embed : int16_box -> int -> unit
val ppl_Int16_Box_add_space_dimensions_and_project : int16_box -> int -> unit
val ppl_Int16_Box_remove_space_dimensions : int16_box -> int list -> unit
val ppl_Int16_Box_remove_higher_space_dimensions : int16_box -> int -> unit
val ppl_Int16_Box_expand_space_dimension : int16_box -> int -> int -> unit
```

```
val ppl_Int16_Box_fold_space_dimensions :
  int16_box -> int list -> int -> unit
val ppl_Int16_Box_map_space_dimensions :
  int16_box -> (int * int) list -> unit
val ppl_Int16_Box_drop_some_non_integer_points :
  int16_box -> complexity_class -> unit
val ppl_Int16_Box_drop_some_non_integer_points_2 :
  int16_box -> int list -> complexity_class -> unit
val ppl_Int16_Box_ascii_dump : int16_box -> string
val ppl_Int16_Box_external_memory_in_bytes : int16_box -> int
val ppl_Int16_Box_total_memory_in_bytes : int16_box -> int
val ppl_Int16_Box_CC76_widening_assign_with_tokens :
  int16_box -> int16_box -> int -> int
val ppl_Int16_Box_CC76_widening_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_widening_assign_with_tokens :
  int16_box -> int16_box -> int -> int
val ppl_Int16_Box_widening_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_limited_CC76_extrapolation_assign_with_tokens :
  int16_box ->
  int16_box -> constraint_system -> int -> int
val ppl_Int16_Box_limited_CC76_extrapolation_assign :
  int16_box ->
  int16_box -> constraint_system -> unit
val ppl_Int16_Box_linear_partition :
  int16_box ->
  int16_box ->
  int16_box * pointset_powerset_nnc_polyhedron
val ppl_Int16_Box_wrap_assign :
  int16_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Int16_Box : int16_box -> bool
val ppl_termination_test_PR_Int16_Box : int16_box -> bool
val ppl_one_affine_ranking_function_MS_Int16_Box :
  int16_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int16_Box :
  int16_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int16_Box : int16_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int16_Box : int16_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int16_Box :
  int16_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Int16_Box_2 : int16_box -> int16_box -> bool
val ppl_termination_test_PR_Int16_Box_2 : int16_box -> int16_box -> bool
val ppl_one_affine_ranking_function_MS_Int16_Box_2 :
  int16_box ->
```

```
  int16_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int16_Box_2 :
  int16_box ->
  int16_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int16_Box_2 :
  int16_box -> int16_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int16_Box_2 :
  int16_box -> int16_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int16_Box_2 :
  int16_box ->
  int16_box -> polyhedron * polyhedron
val ppl_new_Int32_Box_from_space_dimension :
  int -> degenerate_element -> int32_box
val ppl_new_Int32_Box_from_Int8_Box : int8_box -> int32_box
val ppl_new_Int32_Box_from_Int16_Box : int16_box -> int32_box
val ppl_new_Int32_Box_from_Int32_Box : int32_box -> int32_box
val ppl_new_Int32_Box_from_Int64_Box : int64_box -> int32_box
val ppl_new_Int32_Box_from_Uint8_Box : uint8_box -> int32_box
val ppl_new_Int32_Box_from_Uint16_Box : uint16_box -> int32_box
val ppl_new_Int32_Box_from_Uint32_Box : uint32_box -> int32_box
val ppl_new_Int32_Box_from_Uint64_Box : uint64_box -> int32_box
val ppl_new_Int32_Box_from_Z_Box : z_box -> int32_box
val ppl_new_Int32_Box_from_Rational_Box : rational_box -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> int32_box
val ppl_new_Int32_Box_from_C_Polyhedron : polyhedron -> int32_box
val ppl_new_Int32_Box_from_NNC_Polyhedron : polyhedron -> int32_box
val ppl_new_Int32_Box_from_Grid : grid -> int32_box
```

```
val ppl_new_Int32_Box_from_Float_Box : float_box -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_float : bd_shape_float -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> int32_box
val ppl_new_Int32_Box_from_Double_Box : double_box -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_double : bd_shape_double -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> int32_box
val ppl_new_Int32_Box_from_Long_Double_Box : long_double_box -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> int32_box
val ppl_new_Int32_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> int32_box
```

```
val ppl_new_Int32_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Grid_with_complexity :
  grid -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
```

```
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_constraints : constraint_system -> int32_box
val ppl_new_Int32_Box_from_congruences : congruence_system -> int32_box
val ppl_new_Int32_Box_from_generators : generator_system -> int32_box
val ppl_Int32_Box_swap : int32_box -> int32_box -> unit
val ppl_Int32_Box_space_dimension : int32_box -> int
val ppl_Int32_Box_affine_dimension : int32_box -> int
val ppl_Int32_Box_relation_with_constraint :
  int32_box ->
  linear_constraint -> poly_con_relation list
val ppl_Int32_Box_relation_with_generator :
  int32_box ->
  linear_generator -> poly_gen_relation list
val ppl_Int32_Box_relation_with_congruence :
  int32_box ->
  linear_congruence -> poly_con_relation list
val ppl_Int32_Box_get_constraints : int32_box -> constraint_system
val ppl_Int32_Box_get_congruences : int32_box -> congruence_system
val ppl_Int32_Box_get_minimized_constraints : int32_box -> constraint_system
val ppl_Int32_Box_get_minimized_congruences : int32_box -> congruence_system
val ppl_Int32_Box_is_empty : int32_box -> bool
val ppl_Int32_Box_is_universe : int32_box -> bool
val ppl_Int32_Box_is_bounded : int32_box -> bool
val ppl_Int32_Box_contains_integer_point : int32_box -> bool
val ppl_Int32_Box_is_topologically_closed : int32_box -> bool
val ppl_Int32_Box_is_discrete : int32_box -> bool
val ppl_Int32_Box_topological_closure_assign : int32_box -> unit
val ppl_Int32_Box_bounds_from_above : int32_box -> linear_expression -> bool
val ppl_Int32_Box_bounds_from_below : int32_box -> linear_expression -> bool
val ppl_Int32_Box_maximize :
  int32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int32_Box_minimize :
  int32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int32_Box_maximize_with_point :
  int32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int32_Box_minimize_with_point :
  int32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int32_Box_frequency :
  int32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Int32_Box_contains_Int32_Box : int32_box -> int32_box -> bool
```

```
val ppl_Int32_Box_strictly_contains_Int32_Box :
  int32_box -> int32_box -> bool
val ppl_Int32_Box_is_disjoint_from_Int32_Box : int32_box -> int32_box -> bool
val ppl_Int32_Box_equals_Int32_Box : int32_box -> int32_box -> bool
val ppl_Int32_Box_OK : int32_box -> bool
val ppl_Int32_Box_add_constraint : int32_box -> linear_constraint -> unit
val ppl_Int32_Box_add_congruence : int32_box -> linear_congruence -> unit
val ppl_Int32_Box_add_constraints : int32_box -> constraint_system -> unit
val ppl_Int32_Box_add_congruences : int32_box -> congruence_system -> unit
val ppl_Int32_Box_refine_with_constraint :
  int32_box -> linear_constraint -> unit
val ppl_Int32_Box_refine_with_congruence :
  int32_box -> linear_congruence -> unit
val ppl_Int32_Box_refine_with_constraints :
  int32_box -> constraint_system -> unit
val ppl_Int32_Box_refine_with_congruences :
  int32_box -> congruence_system -> unit
val ppl_Int32_Box_intersection_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_upper_bound_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_difference_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_concatenate_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_time_elapse_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_upper_bound_assign_if_exact :
  int32_box -> int32_box -> bool
val ppl_Int32_Box_simplify_using_context_assign :
  int32_box -> int32_box -> bool
val ppl_Int32_Box_constrains : int32_box -> int -> bool
val ppl_Int32_Box_unconstrain_space_dimension : int32_box -> int -> unit
val ppl_Int32_Box_unconstrain_space_dimensions :
  int32_box -> int list -> unit
val ppl_Int32_Box_affine_image :
  int32_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int32_Box_affine_preimage :
  int32_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int32_Box_bounded_affine_image :
  int32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int32_Box_bounded_affine_preimage :
  int32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int32_Box_generalized_affine_image :
  int32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int32_Box_generalized_affine_preimage :
```

```
  int32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int32_Box_generalized_affine_image_lhs_rhs :
  int32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int32_Box_generalized_affine_preimage_lhs_rhs :
  int32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int32_Box_add_space_dimensions_and_embed : int32_box -> int -> unit
val ppl_Int32_Box_add_space_dimensions_and_project : int32_box -> int -> unit
val ppl_Int32_Box_remove_space_dimensions : int32_box -> int list -> unit
val ppl_Int32_Box_remove_higher_space_dimensions : int32_box -> int -> unit
val ppl_Int32_Box_expand_space_dimension : int32_box -> int -> int -> unit
val ppl_Int32_Box_fold_space_dimensions :
  int32_box -> int list -> int -> unit
val ppl_Int32_Box_map_space_dimensions :
  int32_box -> (int * int) list -> unit
val ppl_Int32_Box_drop_some_non_integer_points :
  int32_box -> complexity_class -> unit
val ppl_Int32_Box_drop_some_non_integer_points_2 :
  int32_box -> int list -> complexity_class -> unit
val ppl_Int32_Box_ascii_dump : int32_box -> string
val ppl_Int32_Box_external_memory_in_bytes : int32_box -> int
val ppl_Int32_Box_total_memory_in_bytes : int32_box -> int
val ppl_Int32_Box_CC76_widening_assign_with_tokens :
  int32_box -> int32_box -> int -> int
val ppl_Int32_Box_CC76_widening_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_widening_assign_with_tokens :
  int32_box -> int32_box -> int -> int
val ppl_Int32_Box_widening_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_limited_CC76_extrapolation_assign_with_tokens :
  int32_box ->
  int32_box -> constraint_system -> int -> int
val ppl_Int32_Box_limited_CC76_extrapolation_assign :
  int32_box ->
  int32_box -> constraint_system -> unit
val ppl_Int32_Box_linear_partition :
  int32_box ->
  int32_box ->
  int32_box * pointset_powerset_nnc_polyhedron
val ppl_Int32_Box_wrap_assign :
  int32_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
```

```
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Int32_Box : int32_box -> bool
val ppl_termination_test_PR_Int32_Box : int32_box -> bool
val ppl_one_affine_ranking_function_MS_Int32_Box :
  int32_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int32_Box :
  int32_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int32_Box : int32_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int32_Box : int32_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int32_Box :
  int32_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Int32_Box_2 : int32_box -> int32_box -> bool
val ppl_termination_test_PR_Int32_Box_2 : int32_box -> int32_box -> bool
val ppl_one_affine_ranking_function_MS_Int32_Box_2 :
  int32_box ->
  int32_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int32_Box_2 :
  int32_box ->
  int32_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int32_Box_2 :
  int32_box -> int32_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int32_Box_2 :
  int32_box -> int32_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int32_Box_2 :
  int32_box ->
  int32_box -> polyhedron * polyhedron
val ppl_new_Int64_Box_from_space_dimension :
  int -> degenerate_element -> int64_box
val ppl_new_Int64_Box_from_Int8_Box : int8_box -> int64_box
val ppl_new_Int64_Box_from_Int16_Box : int16_box -> int64_box
val ppl_new_Int64_Box_from_Int32_Box : int32_box -> int64_box
val ppl_new_Int64_Box_from_Int64_Box : int64_box -> int64_box
val ppl_new_Int64_Box_from_Uint8_Box : uint8_box -> int64_box
val ppl_new_Int64_Box_from_Uint16_Box : uint16_box -> int64_box
val ppl_new_Int64_Box_from_Uint32_Box : uint32_box -> int64_box
val ppl_new_Int64_Box_from_Uint64_Box : uint64_box -> int64_box
val ppl_new_Int64_Box_from_Z_Box : z_box -> int64_box
val ppl_new_Int64_Box_from_Rational_Box : rational_box -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> int64_box
```

```
val ppl_new_Int64_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> int64_box
val ppl_new_Int64_Box_from_C_Polyhedron : polyhedron -> int64_box
val ppl_new_Int64_Box_from_NNC_Polyhedron : polyhedron -> int64_box
val ppl_new_Int64_Box_from_Grid : grid -> int64_box
val ppl_new_Int64_Box_from_Float_Box : float_box -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_float : bd_shape_float -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> int64_box
val ppl_new_Int64_Box_from_Double_Box : double_box -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_double : bd_shape_double -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> int64_box
val ppl_new_Int64_Box_from_Long_Double_Box : long_double_box -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> int64_box
val ppl_new_Int64_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Rational_Box_with_complexity :
```

```
  rational_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Grid_with_complexity :
  grid -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> int64_box
```

```
val ppl_new_Int64_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_constraints : constraint_system -> int64_box
val ppl_new_Int64_Box_from_congruences : congruence_system -> int64_box
val ppl_new_Int64_Box_from_generators : generator_system -> int64_box
val ppl_Int64_Box_swap : int64_box -> int64_box -> unit
val ppl_Int64_Box_space_dimension : int64_box -> int
val ppl_Int64_Box_affine_dimension : int64_box -> int
val ppl_Int64_Box_relation_with_constraint :
  int64_box ->
  linear_constraint -> poly_con_relation list
val ppl_Int64_Box_relation_with_generator :
  int64_box ->
  linear_generator -> poly_gen_relation list
val ppl_Int64_Box_relation_with_congruence :
  int64_box ->
  linear_congruence -> poly_con_relation list
val ppl_Int64_Box_get_constraints : int64_box -> constraint_system
val ppl_Int64_Box_get_congruences : int64_box -> congruence_system
val ppl_Int64_Box_get_minimized_constraints : int64_box -> constraint_system
val ppl_Int64_Box_get_minimized_congruences : int64_box -> congruence_system
val ppl_Int64_Box_is_empty : int64_box -> bool
val ppl_Int64_Box_is_universe : int64_box -> bool
val ppl_Int64_Box_is_bounded : int64_box -> bool
val ppl_Int64_Box_contains_integer_point : int64_box -> bool
val ppl_Int64_Box_is_topologically_closed : int64_box -> bool
val ppl_Int64_Box_is_discrete : int64_box -> bool
val ppl_Int64_Box_topological_closure_assign : int64_box -> unit
val ppl_Int64_Box_bounds_from_above : int64_box -> linear_expression -> bool
val ppl_Int64_Box_bounds_from_below : int64_box -> linear_expression -> bool
val ppl_Int64_Box_maximize :
  int64_box ->
```

```
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int64_Box_minimize :
  int64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int64_Box_maximize_with_point :
  int64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int64_Box_minimize_with_point :
  int64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int64_Box_frequency :
  int64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Int64_Box_contains_Int64_Box : int64_box -> int64_box -> bool
val ppl_Int64_Box_strictly_contains_Int64_Box :
  int64_box -> int64_box -> bool
val ppl_Int64_Box_is_disjoint_from_Int64_Box : int64_box -> int64_box -> bool
val ppl_Int64_Box_equals_Int64_Box : int64_box -> int64_box -> bool
val ppl_Int64_Box_OK : int64_box -> bool
val ppl_Int64_Box_add_constraint : int64_box -> linear_constraint -> unit
val ppl_Int64_Box_add_congruence : int64_box -> linear_congruence -> unit
val ppl_Int64_Box_add_constraints : int64_box -> constraint_system -> unit
val ppl_Int64_Box_add_congruences : int64_box -> congruence_system -> unit
val ppl_Int64_Box_refine_with_constraint :
  int64_box -> linear_constraint -> unit
val ppl_Int64_Box_refine_with_congruence :
  int64_box -> linear_congruence -> unit
val ppl_Int64_Box_refine_with_constraints :
  int64_box -> constraint_system -> unit
val ppl_Int64_Box_refine_with_congruences :
  int64_box -> congruence_system -> unit
val ppl_Int64_Box_intersection_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_upper_bound_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_difference_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_concatenate_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_time_elapse_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_upper_bound_assign_if_exact :
  int64_box -> int64_box -> bool
val ppl_Int64_Box_simplify_using_context_assign :
  int64_box -> int64_box -> bool
val ppl_Int64_Box_constrains : int64_box -> int -> bool
val ppl_Int64_Box_unconstrain_space_dimension : int64_box -> int -> unit
val ppl_Int64_Box_unconstrain_space_dimensions :
  int64_box -> int list -> unit
val ppl_Int64_Box_affine_image :
```

```
  int64_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int64_Box_affine_preimage :
  int64_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int64_Box_bounded_affine_image :
  int64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int64_Box_bounded_affine_preimage :
  int64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int64_Box_generalized_affine_image :
  int64_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int64_Box_generalized_affine_preimage :
  int64_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int64_Box_generalized_affine_image_lhs_rhs :
  int64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int64_Box_generalized_affine_preimage_lhs_rhs :
  int64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int64_Box_add_space_dimensions_and_embed : int64_box -> int -> unit
val ppl_Int64_Box_add_space_dimensions_and_project : int64_box -> int -> unit
val ppl_Int64_Box_remove_space_dimensions : int64_box -> int list -> unit
val ppl_Int64_Box_remove_higher_space_dimensions : int64_box -> int -> unit
val ppl_Int64_Box_expand_space_dimension : int64_box -> int -> int -> unit
val ppl_Int64_Box_fold_space_dimensions :
  int64_box -> int list -> int -> unit
val ppl_Int64_Box_map_space_dimensions :
  int64_box -> (int * int) list -> unit
val ppl_Int64_Box_drop_some_non_integer_points :
  int64_box -> complexity_class -> unit
val ppl_Int64_Box_drop_some_non_integer_points_2 :
  int64_box -> int list -> complexity_class -> unit
val ppl_Int64_Box_ascii_dump : int64_box -> string
val ppl_Int64_Box_external_memory_in_bytes : int64_box -> int
val ppl_Int64_Box_total_memory_in_bytes : int64_box -> int
val ppl_Int64_Box_CC76_widening_assign_with_tokens :
  int64_box -> int64_box -> int -> int
val ppl_Int64_Box_CC76_widening_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_widening_assign_with_tokens :
  int64_box -> int64_box -> int -> int
```

```
val ppl_Int64_Box_widening_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_limited_CC76_extrapolation_assign_with_tokens :
  int64_box ->
  int64_box -> constraint_system -> int -> int
val ppl_Int64_Box_limited_CC76_extrapolation_assign :
  int64_box ->
  int64_box -> constraint_system -> unit
val ppl_Int64_Box_linear_partition :
  int64_box ->
  int64_box ->
  int64_box * pointset_powerset_nnc_polyhedron
val ppl_Int64_Box_wrap_assign :
  int64_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Int64_Box : int64_box -> bool
val ppl_termination_test_PR_Int64_Box : int64_box -> bool
val ppl_one_affine_ranking_function_MS_Int64_Box :
  int64_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int64_Box :
  int64_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int64_Box : int64_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int64_Box : int64_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int64_Box :
  int64_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Int64_Box_2 : int64_box -> int64_box -> bool
val ppl_termination_test_PR_Int64_Box_2 : int64_box -> int64_box -> bool
val ppl_one_affine_ranking_function_MS_Int64_Box_2 :
  int64_box ->
  int64_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int64_Box_2 :
  int64_box ->
  int64_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int64_Box_2 :
  int64_box -> int64_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int64_Box_2 :
  int64_box -> int64_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int64_Box_2 :
  int64_box ->
  int64_box -> polyhedron * polyhedron
val ppl_new_Uint8_Box_from_space_dimension :
  int -> degenerate_element -> uint8_box
val ppl_new_Uint8_Box_from_Int8_Box : int8_box -> uint8_box
val ppl_new_Uint8_Box_from_Int16_Box : int16_box -> uint8_box
val ppl_new_Uint8_Box_from_Int32_Box : int32_box -> uint8_box
```

```
val ppl_new_Uint8_Box_from_Int64_Box : int64_box -> uint8_box
val ppl_new_Uint8_Box_from_Uint8_Box : uint8_box -> uint8_box
val ppl_new_Uint8_Box_from_Uint16_Box : uint16_box -> uint8_box
val ppl_new_Uint8_Box_from_Uint32_Box : uint32_box -> uint8_box
val ppl_new_Uint8_Box_from_Uint64_Box : uint64_box -> uint8_box
val ppl_new_Uint8_Box_from_Z_Box : z_box -> uint8_box
val ppl_new_Uint8_Box_from_Rational_Box : rational_box -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> uint8_box
val ppl_new_Uint8_Box_from_C_Polyhedron : polyhedron -> uint8_box
val ppl_new_Uint8_Box_from_NNC_Polyhedron : polyhedron -> uint8_box
val ppl_new_Uint8_Box_from_Grid : grid -> uint8_box
val ppl_new_Uint8_Box_from_Float_Box : float_box -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_float : bd_shape_float -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> uint8_box
val ppl_new_Uint8_Box_from_Double_Box : double_box -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_double : bd_shape_double -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> uint8_box
val ppl_new_Uint8_Box_from_Long_Double_Box : long_double_box -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> uint8_box
val ppl_new_Uint8_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Int16_Box_with_complexity :
```

```
  int16_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
```

```
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Grid_with_complexity :
  grid -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_constraints : constraint_system -> uint8_box
val ppl_new_Uint8_Box_from_congruences : congruence_system -> uint8_box
val ppl_new_Uint8_Box_from_generators : generator_system -> uint8_box
val ppl_Uint8_Box_swap : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_space_dimension : uint8_box -> int
val ppl_Uint8_Box_affine_dimension : uint8_box -> int
val ppl_Uint8_Box_relation_with_constraint :
  uint8_box ->
  linear_constraint -> poly_con_relation list
val ppl_Uint8_Box_relation_with_generator :
  uint8_box ->
  linear_generator -> poly_gen_relation list
val ppl_Uint8_Box_relation_with_congruence :
  uint8_box ->
  linear_congruence -> poly_con_relation list
```

```
val ppl_Uint8_Box_get_constraints : uint8_box -> constraint_system
val ppl_Uint8_Box_get_congruences : uint8_box -> congruence_system
val ppl_Uint8_Box_get_minimized_constraints : uint8_box -> constraint_system
val ppl_Uint8_Box_get_minimized_congruences : uint8_box -> congruence_system
val ppl_Uint8_Box_is_empty : uint8_box -> bool
val ppl_Uint8_Box_is_universe : uint8_box -> bool
val ppl_Uint8_Box_is_bounded : uint8_box -> bool
val ppl_Uint8_Box_contains_integer_point : uint8_box -> bool
val ppl_Uint8_Box_is_topologically_closed : uint8_box -> bool
val ppl_Uint8_Box_is_discrete : uint8_box -> bool
val ppl_Uint8_Box_topological_closure_assign : uint8_box -> unit
val ppl_Uint8_Box_bounds_from_above : uint8_box -> linear_expression -> bool
val ppl_Uint8_Box_bounds_from_below : uint8_box -> linear_expression -> bool
val ppl_Uint8_Box_maximize :
  uint8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint8_Box_minimize :
  uint8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint8_Box_maximize_with_point :
  uint8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint8_Box_minimize_with_point :
  uint8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint8_Box_frequency :
  uint8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Uint8_Box_contains_Uint8_Box : uint8_box -> uint8_box -> bool
val ppl_Uint8_Box_strictly_contains_Uint8_Box :
  uint8_box -> uint8_box -> bool
val ppl_Uint8_Box_is_disjoint_from_Uint8_Box : uint8_box -> uint8_box -> bool
val ppl_Uint8_Box_equals_Uint8_Box : uint8_box -> uint8_box -> bool
val ppl_Uint8_Box_OK : uint8_box -> bool
val ppl_Uint8_Box_add_constraint : uint8_box -> linear_constraint -> unit
val ppl_Uint8_Box_add_congruence : uint8_box -> linear_congruence -> unit
val ppl_Uint8_Box_add_constraints : uint8_box -> constraint_system -> unit
val ppl_Uint8_Box_add_congruences : uint8_box -> congruence_system -> unit
val ppl_Uint8_Box_refine_with_constraint :
  uint8_box -> linear_constraint -> unit
val ppl_Uint8_Box_refine_with_congruence :
  uint8_box -> linear_congruence -> unit
val ppl_Uint8_Box_refine_with_constraints :
  uint8_box -> constraint_system -> unit
val ppl_Uint8_Box_refine_with_congruences :
```

```
  uint8_box -> congruence_system -> unit
val ppl_Uint8_Box_intersection_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_upper_bound_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_difference_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_concatenate_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_time_elapse_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_upper_bound_assign_if_exact :
  uint8_box -> uint8_box -> bool
val ppl_Uint8_Box_simplify_using_context_assign :
  uint8_box -> uint8_box -> bool
val ppl_Uint8_Box_constrains : uint8_box -> int -> bool
val ppl_Uint8_Box_unconstrain_space_dimension : uint8_box -> int -> unit
val ppl_Uint8_Box_unconstrain_space_dimensions :
  uint8_box -> int list -> unit
val ppl_Uint8_Box_affine_image :
  uint8_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint8_Box_affine_preimage :
  uint8_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint8_Box_bounded_affine_image :
  uint8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint8_Box_bounded_affine_preimage :
  uint8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint8_Box_generalized_affine_image :
  uint8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint8_Box_generalized_affine_preimage :
  uint8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint8_Box_generalized_affine_image_lhs_rhs :
  uint8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint8_Box_generalized_affine_preimage_lhs_rhs :
  uint8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint8_Box_add_space_dimensions_and_embed : uint8_box -> int -> unit
val ppl_Uint8_Box_add_space_dimensions_and_project : uint8_box -> int -> unit
val ppl_Uint8_Box_remove_space_dimensions : uint8_box -> int list -> unit
val ppl_Uint8_Box_remove_higher_space_dimensions : uint8_box -> int -> unit
val ppl_Uint8_Box_expand_space_dimension : uint8_box -> int -> int -> unit
val ppl_Uint8_Box_fold_space_dimensions :
```

```
  uint8_box -> int list -> int -> unit
val ppl_Uint8_Box_map_space_dimensions :
  uint8_box -> (int * int) list -> unit
val ppl_Uint8_Box_drop_some_non_integer_points :
  uint8_box -> complexity_class -> unit
val ppl_Uint8_Box_drop_some_non_integer_points_2 :
  uint8_box -> int list -> complexity_class -> unit
val ppl_Uint8_Box_ascii_dump : uint8_box -> string
val ppl_Uint8_Box_external_memory_in_bytes : uint8_box -> int
val ppl_Uint8_Box_total_memory_in_bytes : uint8_box -> int
val ppl_Uint8_Box_CC76_widening_assign_with_tokens :
  uint8_box -> uint8_box -> int -> int
val ppl_Uint8_Box_CC76_widening_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_widening_assign_with_tokens :
  uint8_box -> uint8_box -> int -> int
val ppl_Uint8_Box_widening_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_limited_CC76_extrapolation_assign_with_tokens :
  uint8_box ->
  uint8_box -> constraint_system -> int -> int
val ppl_Uint8_Box_limited_CC76_extrapolation_assign :
  uint8_box ->
  uint8_box -> constraint_system -> unit
val ppl_Uint8_Box_linear_partition :
  uint8_box ->
  uint8_box ->
  uint8_box * pointset_powerset_nnc_polyhedron
val ppl_Uint8_Box_wrap_assign :
  uint8_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Uint8_Box : uint8_box -> bool
val ppl_termination_test_PR_Uint8_Box : uint8_box -> bool
val ppl_one_affine_ranking_function_MS_Uint8_Box :
  uint8_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint8_Box :
  uint8_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint8_Box : uint8_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint8_Box : uint8_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint8_Box :
  uint8_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Uint8_Box_2 : uint8_box -> uint8_box -> bool
val ppl_termination_test_PR_Uint8_Box_2 : uint8_box -> uint8_box -> bool
val ppl_one_affine_ranking_function_MS_Uint8_Box_2 :
  uint8_box ->
  uint8_box -> bool * linear_generator
```

```
val ppl_one_affine_ranking_function_PR_Uint8_Box_2 :
  uint8_box ->
  uint8_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint8_Box_2 :
  uint8_box -> uint8_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint8_Box_2 :
  uint8_box -> uint8_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint8_Box_2 :
  uint8_box ->
  uint8_box -> polyhedron * polyhedron
val ppl_new_Uint16_Box_from_space_dimension :
  int -> degenerate_element -> uint16_box
val ppl_new_Uint16_Box_from_Int8_Box : int8_box -> uint16_box
val ppl_new_Uint16_Box_from_Int16_Box : int16_box -> uint16_box
val ppl_new_Uint16_Box_from_Int32_Box : int32_box -> uint16_box
val ppl_new_Uint16_Box_from_Int64_Box : int64_box -> uint16_box
val ppl_new_Uint16_Box_from_Uint8_Box : uint8_box -> uint16_box
val ppl_new_Uint16_Box_from_Uint16_Box : uint16_box -> uint16_box
val ppl_new_Uint16_Box_from_Uint32_Box : uint32_box -> uint16_box
val ppl_new_Uint16_Box_from_Uint64_Box : uint64_box -> uint16_box
val ppl_new_Uint16_Box_from_Z_Box : z_box -> uint16_box
val ppl_new_Uint16_Box_from_Rational_Box : rational_box -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> uint16_box
val ppl_new_Uint16_Box_from_C_Polyhedron : polyhedron -> uint16_box
val ppl_new_Uint16_Box_from_NNC_Polyhedron : polyhedron -> uint16_box
val ppl_new_Uint16_Box_from_Grid : grid -> uint16_box
val ppl_new_Uint16_Box_from_Float_Box : float_box -> uint16_box
```

```
val ppl_new_Uint16_Box_from_BD_Shape_float : bd_shape_float -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> uint16_box
val ppl_new_Uint16_Box_from_Double_Box : double_box -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_double : bd_shape_double -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> uint16_box
val ppl_new_Uint16_Box_from_Long_Double_Box : long_double_box -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> uint16_box
val ppl_new_Uint16_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_mpq_class_with_complexity :
```

```
  bd_shape_mpq_class ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Grid_with_complexity :
  grid -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
```

```
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_constraints : constraint_system -> uint16_box
val ppl_new_Uint16_Box_from_congruences : congruence_system -> uint16_box
val ppl_new_Uint16_Box_from_generators : generator_system -> uint16_box
val ppl_Uint16_Box_swap : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_space_dimension : uint16_box -> int
val ppl_Uint16_Box_affine_dimension : uint16_box -> int
val ppl_Uint16_Box_relation_with_constraint :
  uint16_box ->
  linear_constraint -> poly_con_relation list
val ppl_Uint16_Box_relation_with_generator :
  uint16_box ->
  linear_generator -> poly_gen_relation list
val ppl_Uint16_Box_relation_with_congruence :
  uint16_box ->
  linear_congruence -> poly_con_relation list
val ppl_Uint16_Box_get_constraints : uint16_box -> constraint_system
val ppl_Uint16_Box_get_congruences : uint16_box -> congruence_system
val ppl_Uint16_Box_get_minimized_constraints :
  uint16_box -> constraint_system
val ppl_Uint16_Box_get_minimized_congruences :
  uint16_box -> congruence_system
val ppl_Uint16_Box_is_empty : uint16_box -> bool
val ppl_Uint16_Box_is_universe : uint16_box -> bool
val ppl_Uint16_Box_is_bounded : uint16_box -> bool
val ppl_Uint16_Box_contains_integer_point : uint16_box -> bool
val ppl_Uint16_Box_is_topologically_closed : uint16_box -> bool
val ppl_Uint16_Box_is_discrete : uint16_box -> bool
val ppl_Uint16_Box_topological_closure_assign : uint16_box -> unit
val ppl_Uint16_Box_bounds_from_above :
  uint16_box -> linear_expression -> bool
val ppl_Uint16_Box_bounds_from_below :
  uint16_box -> linear_expression -> bool
val ppl_Uint16_Box_maximize :
  uint16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint16_Box_minimize :
  uint16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint16_Box_maximize_with_point :
  uint16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint16_Box_minimize_with_point :
  uint16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
```

```
val ppl_Uint16_Box_frequency :
  uint16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Uint16_Box_contains_Uint16_Box : uint16_box -> uint16_box -> bool
val ppl_Uint16_Box_strictly_contains_Uint16_Box :
  uint16_box -> uint16_box -> bool
val ppl_Uint16_Box_is_disjoint_from_Uint16_Box :
  uint16_box -> uint16_box -> bool
val ppl_Uint16_Box_equals_Uint16_Box : uint16_box -> uint16_box -> bool
val ppl_Uint16_Box_OK : uint16_box -> bool
val ppl_Uint16_Box_add_constraint : uint16_box -> linear_constraint -> unit
val ppl_Uint16_Box_add_congruence : uint16_box -> linear_congruence -> unit
val ppl_Uint16_Box_add_constraints : uint16_box -> constraint_system -> unit
val ppl_Uint16_Box_add_congruences : uint16_box -> congruence_system -> unit
val ppl_Uint16_Box_refine_with_constraint :
  uint16_box -> linear_constraint -> unit
val ppl_Uint16_Box_refine_with_congruence :
  uint16_box -> linear_congruence -> unit
val ppl_Uint16_Box_refine_with_constraints :
  uint16_box -> constraint_system -> unit
val ppl_Uint16_Box_refine_with_congruences :
  uint16_box -> congruence_system -> unit
val ppl_Uint16_Box_intersection_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_upper_bound_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_difference_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_concatenate_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_time_elapse_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_upper_bound_assign_if_exact :
  uint16_box -> uint16_box -> bool
val ppl_Uint16_Box_simplify_using_context_assign :
  uint16_box -> uint16_box -> bool
val ppl_Uint16_Box_constrains : uint16_box -> int -> bool
val ppl_Uint16_Box_unconstrain_space_dimension : uint16_box -> int -> unit
val ppl_Uint16_Box_unconstrain_space_dimensions :
  uint16_box -> int list -> unit
val ppl_Uint16_Box_affine_image :
  uint16_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint16_Box_affine_preimage :
  uint16_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint16_Box_bounded_affine_image :
  uint16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint16_Box_bounded_affine_preimage :
  uint16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Uint16_Box_generalized_affine_image :
  uint16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint16_Box_generalized_affine_preimage :
  uint16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint16_Box_generalized_affine_image_lhs_rhs :
  uint16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint16_Box_generalized_affine_preimage_lhs_rhs :
  uint16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint16_Box_add_space_dimensions_and_embed : uint16_box -> int -> unit
val ppl_Uint16_Box_add_space_dimensions_and_project :
  uint16_box -> int -> unit
val ppl_Uint16_Box_remove_space_dimensions : uint16_box -> int list -> unit
val ppl_Uint16_Box_remove_higher_space_dimensions : uint16_box -> int -> unit
val ppl_Uint16_Box_expand_space_dimension : uint16_box -> int -> int -> unit
val ppl_Uint16_Box_fold_space_dimensions :
  uint16_box -> int list -> int -> unit
val ppl_Uint16_Box_map_space_dimensions :
  uint16_box -> (int * int) list -> unit
val ppl_Uint16_Box_drop_some_non_integer_points :
  uint16_box -> complexity_class -> unit
val ppl_Uint16_Box_drop_some_non_integer_points_2 :
  uint16_box -> int list -> complexity_class -> unit
val ppl_Uint16_Box_ascii_dump : uint16_box -> string
val ppl_Uint16_Box_external_memory_in_bytes : uint16_box -> int
val ppl_Uint16_Box_total_memory_in_bytes : uint16_box -> int
val ppl_Uint16_Box_CC76_widening_assign_with_tokens :
  uint16_box -> uint16_box -> int -> int
val ppl_Uint16_Box_CC76_widening_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_widening_assign_with_tokens :
  uint16_box -> uint16_box -> int -> int
val ppl_Uint16_Box_widening_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_limited_CC76_extrapolation_assign_with_tokens :
  uint16_box ->
  uint16_box -> constraint_system -> int -> int
val ppl_Uint16_Box_limited_CC76_extrapolation_assign :
  uint16_box ->
  uint16_box -> constraint_system -> unit
val ppl_Uint16_Box_linear_partition :
  uint16_box ->
  uint16_box ->
  uint16_box * pointset_powerset_nnc_polyhedron
```

```
val ppl_Uint16_Box_wrap_assign :
  uint16_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Uint16_Box : uint16_box -> bool
val ppl_termination_test_PR_Uint16_Box : uint16_box -> bool
val ppl_one_affine_ranking_function_MS_Uint16_Box :
  uint16_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint16_Box :
  uint16_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint16_Box : uint16_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint16_Box : uint16_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint16_Box :
  uint16_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Uint16_Box_2 : uint16_box -> uint16_box -> bool
val ppl_termination_test_PR_Uint16_Box_2 : uint16_box -> uint16_box -> bool
val ppl_one_affine_ranking_function_MS_Uint16_Box_2 :
  uint16_box ->
  uint16_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint16_Box_2 :
  uint16_box ->
  uint16_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint16_Box_2 :
  uint16_box -> uint16_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint16_Box_2 :
  uint16_box -> uint16_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint16_Box_2 :
  uint16_box ->
  uint16_box -> polyhedron * polyhedron
val ppl_new_Uint32_Box_from_space_dimension :
  int -> degenerate_element -> uint32_box
val ppl_new_Uint32_Box_from_Int8_Box : int8_box -> uint32_box
val ppl_new_Uint32_Box_from_Int16_Box : int16_box -> uint32_box
val ppl_new_Uint32_Box_from_Int32_Box : int32_box -> uint32_box
val ppl_new_Uint32_Box_from_Int64_Box : int64_box -> uint32_box
val ppl_new_Uint32_Box_from_Uint8_Box : uint8_box -> uint32_box
val ppl_new_Uint32_Box_from_Uint16_Box : uint16_box -> uint32_box
val ppl_new_Uint32_Box_from_Uint32_Box : uint32_box -> uint32_box
val ppl_new_Uint32_Box_from_Uint64_Box : uint64_box -> uint32_box
val ppl_new_Uint32_Box_from_Z_Box : z_box -> uint32_box
val ppl_new_Uint32_Box_from_Rational_Box : rational_box -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> uint32_box
```

```
val ppl_new_Uint32_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> uint32_box
val ppl_new_Uint32_Box_from_C_Polyhedron : polyhedron -> uint32_box
val ppl_new_Uint32_Box_from_NNC_Polyhedron : polyhedron -> uint32_box
val ppl_new_Uint32_Box_from_Grid : grid -> uint32_box
val ppl_new_Uint32_Box_from_Float_Box : float_box -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_float : bd_shape_float -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> uint32_box
val ppl_new_Uint32_Box_from_Double_Box : double_box -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_double : bd_shape_double -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> uint32_box
val ppl_new_Uint32_Box_from_Long_Double_Box : long_double_box -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> uint32_box
val ppl_new_Uint32_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> uint32_box
```

```
val ppl_new_Uint32_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Grid_with_complexity :
  grid -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> uint32_box
```

```
val ppl_new_Uint32_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_constraints : constraint_system -> uint32_box
val ppl_new_Uint32_Box_from_congruences : congruence_system -> uint32_box
val ppl_new_Uint32_Box_from_generators : generator_system -> uint32_box
val ppl_Uint32_Box_swap : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_space_dimension : uint32_box -> int
val ppl_Uint32_Box_affine_dimension : uint32_box -> int
val ppl_Uint32_Box_relation_with_constraint :
  uint32_box ->
  linear_constraint -> poly_con_relation list
val ppl_Uint32_Box_relation_with_generator :
  uint32_box ->
  linear_generator -> poly_gen_relation list
val ppl_Uint32_Box_relation_with_congruence :
  uint32_box ->
  linear_congruence -> poly_con_relation list
val ppl_Uint32_Box_get_constraints : uint32_box -> constraint_system
val ppl_Uint32_Box_get_congruences : uint32_box -> congruence_system
val ppl_Uint32_Box_get_minimized_constraints :
  uint32_box -> constraint_system
val ppl_Uint32_Box_get_minimized_congruences :
  uint32_box -> congruence_system
val ppl_Uint32_Box_is_empty : uint32_box -> bool
val ppl_Uint32_Box_is_universe : uint32_box -> bool
val ppl_Uint32_Box_is_bounded : uint32_box -> bool
val ppl_Uint32_Box_contains_integer_point : uint32_box -> bool
```

```
val ppl_Uint32_Box_is_topologically_closed : uint32_box -> bool
val ppl_Uint32_Box_is_discrete : uint32_box -> bool
val ppl_Uint32_Box_topological_closure_assign : uint32_box -> unit
val ppl_Uint32_Box_bounds_from_above :
  uint32_box -> linear_expression -> bool
val ppl_Uint32_Box_bounds_from_below :
  uint32_box -> linear_expression -> bool
val ppl_Uint32_Box_maximize :
  uint32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint32_Box_minimize :
  uint32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint32_Box_maximize_with_point :
  uint32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint32_Box_minimize_with_point :
  uint32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint32_Box_frequency :
  uint32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Uint32_Box_contains_Uint32_Box : uint32_box -> uint32_box -> bool
val ppl_Uint32_Box_strictly_contains_Uint32_Box :
  uint32_box -> uint32_box -> bool
val ppl_Uint32_Box_is_disjoint_from_Uint32_Box :
  uint32_box -> uint32_box -> bool
val ppl_Uint32_Box_equals_Uint32_Box : uint32_box -> uint32_box -> bool
val ppl_Uint32_Box_OK : uint32_box -> bool
val ppl_Uint32_Box_add_constraint : uint32_box -> linear_constraint -> unit
val ppl_Uint32_Box_add_congruence : uint32_box -> linear_congruence -> unit
val ppl_Uint32_Box_add_constraints : uint32_box -> constraint_system -> unit
val ppl_Uint32_Box_add_congruences : uint32_box -> congruence_system -> unit
val ppl_Uint32_Box_refine_with_constraint :
  uint32_box -> linear_constraint -> unit
val ppl_Uint32_Box_refine_with_congruence :
  uint32_box -> linear_congruence -> unit
val ppl_Uint32_Box_refine_with_constraints :
  uint32_box -> constraint_system -> unit
val ppl_Uint32_Box_refine_with_congruences :
  uint32_box -> congruence_system -> unit
val ppl_Uint32_Box_intersection_assign : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_upper_bound_assign : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_difference_assign : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_concatenate_assign : uint32_box -> uint32_box -> unit
```

```
val ppl_Uint32_Box_time_elapse_assign : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_upper_bound_assign_if_exact :
  uint32_box -> uint32_box -> bool
val ppl_Uint32_Box_simplify_using_context_assign :
  uint32_box -> uint32_box -> bool
val ppl_Uint32_Box_constrains : uint32_box -> int -> bool
val ppl_Uint32_Box_unconstrain_space_dimension : uint32_box -> int -> unit
val ppl_Uint32_Box_unconstrain_space_dimensions :
  uint32_box -> int list -> unit
val ppl_Uint32_Box_affine_image :
  uint32_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint32_Box_affine_preimage :
  uint32_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint32_Box_bounded_affine_image :
  uint32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint32_Box_bounded_affine_preimage :
  uint32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint32_Box_generalized_affine_image :
  uint32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint32_Box_generalized_affine_preimage :
  uint32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint32_Box_generalized_affine_image_lhs_rhs :
  uint32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint32_Box_generalized_affine_preimage_lhs_rhs :
  uint32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint32_Box_add_space_dimensions_and_embed : uint32_box -> int -> unit
val ppl_Uint32_Box_add_space_dimensions_and_project :
  uint32_box -> int -> unit
val ppl_Uint32_Box_remove_space_dimensions : uint32_box -> int list -> unit
val ppl_Uint32_Box_remove_higher_space_dimensions : uint32_box -> int -> unit
val ppl_Uint32_Box_expand_space_dimension : uint32_box -> int -> int -> unit
val ppl_Uint32_Box_fold_space_dimensions :
  uint32_box -> int list -> int -> unit
val ppl_Uint32_Box_map_space_dimensions :
  uint32_box -> (int * int) list -> unit
val ppl_Uint32_Box_drop_some_non_integer_points :
  uint32_box -> complexity_class -> unit
```

```
val ppl_Uint32_Box_drop_some_non_integer_points_2 :
  uint32_box -> int list -> complexity_class -> unit
val ppl_Uint32_Box_ascii_dump : uint32_box -> string
val ppl_Uint32_Box_external_memory_in_bytes : uint32_box -> int
val ppl_Uint32_Box_total_memory_in_bytes : uint32_box -> int
val ppl_Uint32_Box_CC76_widening_assign_with_tokens :
  uint32_box -> uint32_box -> int -> int
val ppl_Uint32_Box_CC76_widening_assign : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_widening_assign_with_tokens :
  uint32_box -> uint32_box -> int -> int
val ppl_Uint32_Box_widening_assign : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_limited_CC76_extrapolation_assign_with_tokens :
  uint32_box ->
  uint32_box -> constraint_system -> int -> int
val ppl_Uint32_Box_limited_CC76_extrapolation_assign :
  uint32_box ->
  uint32_box -> constraint_system -> unit
val ppl_Uint32_Box_linear_partition :
  uint32_box ->
  uint32_box ->
  uint32_box * pointset_powerset_nnc_polyhedron
val ppl_Uint32_Box_wrap_assign :
  uint32_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Uint32_Box : uint32_box -> bool
val ppl_termination_test_PR_Uint32_Box : uint32_box -> bool
val ppl_one_affine_ranking_function_MS_Uint32_Box :
  uint32_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint32_Box :
  uint32_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint32_Box : uint32_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint32_Box : uint32_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint32_Box :
  uint32_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Uint32_Box_2 : uint32_box -> uint32_box -> bool
val ppl_termination_test_PR_Uint32_Box_2 : uint32_box -> uint32_box -> bool
val ppl_one_affine_ranking_function_MS_Uint32_Box_2 :
  uint32_box ->
  uint32_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint32_Box_2 :
  uint32_box ->
  uint32_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint32_Box_2 :
  uint32_box -> uint32_box -> polyhedron
```

```
val ppl_all_affine_ranking_functions_PR_Uint32_Box_2 :
  uint32_box -> uint32_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint32_Box_2 :
  uint32_box ->
  uint32_box -> polyhedron * polyhedron
val ppl_new_Uint64_Box_from_space_dimension :
  int -> degenerate_element -> uint64_box
val ppl_new_Uint64_Box_from_Int8_Box : int8_box -> uint64_box
val ppl_new_Uint64_Box_from_Int16_Box : int16_box -> uint64_box
val ppl_new_Uint64_Box_from_Int32_Box : int32_box -> uint64_box
val ppl_new_Uint64_Box_from_Int64_Box : int64_box -> uint64_box
val ppl_new_Uint64_Box_from_Uint8_Box : uint8_box -> uint64_box
val ppl_new_Uint64_Box_from_Uint16_Box : uint16_box -> uint64_box
val ppl_new_Uint64_Box_from_Uint32_Box : uint32_box -> uint64_box
val ppl_new_Uint64_Box_from_Uint64_Box : uint64_box -> uint64_box
val ppl_new_Uint64_Box_from_Z_Box : z_box -> uint64_box
val ppl_new_Uint64_Box_from_Rational_Box : rational_box -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> uint64_box
val ppl_new_Uint64_Box_from_C_Polyhedron : polyhedron -> uint64_box
val ppl_new_Uint64_Box_from_NNC_Polyhedron : polyhedron -> uint64_box
val ppl_new_Uint64_Box_from_Grid : grid -> uint64_box
val ppl_new_Uint64_Box_from_Float_Box : float_box -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_float : bd_shape_float -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> uint64_box
val ppl_new_Uint64_Box_from_Double_Box : double_box -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_double : bd_shape_double -> uint64_box
```

```
val ppl_new_Uint64_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> uint64_box
val ppl_new_Uint64_Box_from_Long_Double_Box : long_double_box -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> uint64_box
val ppl_new_Uint64_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int16_t_with_complexity :
```

```
  octagonal_shape_int16_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Grid_with_complexity :
  grid -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_constraints : constraint_system -> uint64_box
val ppl_new_Uint64_Box_from_congruences : congruence_system -> uint64_box
val ppl_new_Uint64_Box_from_generators : generator_system -> uint64_box
val ppl_Uint64_Box_swap : uint64_box -> uint64_box -> unit
```

```
val ppl_Uint64_Box_space_dimension : uint64_box -> int
val ppl_Uint64_Box_affine_dimension : uint64_box -> int
val ppl_Uint64_Box_relation_with_constraint :
  uint64_box ->
  linear_constraint -> poly_con_relation list
val ppl_Uint64_Box_relation_with_generator :
  uint64_box ->
  linear_generator -> poly_gen_relation list
val ppl_Uint64_Box_relation_with_congruence :
  uint64_box ->
  linear_congruence -> poly_con_relation list
val ppl_Uint64_Box_get_constraints : uint64_box -> constraint_system
val ppl_Uint64_Box_get_congruences : uint64_box -> congruence_system
val ppl_Uint64_Box_get_minimized_constraints :
  uint64_box -> constraint_system
val ppl_Uint64_Box_get_minimized_congruences :
  uint64_box -> congruence_system
val ppl_Uint64_Box_is_empty : uint64_box -> bool
val ppl_Uint64_Box_is_universe : uint64_box -> bool
val ppl_Uint64_Box_is_bounded : uint64_box -> bool
val ppl_Uint64_Box_contains_integer_point : uint64_box -> bool
val ppl_Uint64_Box_is_topologically_closed : uint64_box -> bool
val ppl_Uint64_Box_is_discrete : uint64_box -> bool
val ppl_Uint64_Box_topological_closure_assign : uint64_box -> unit
val ppl_Uint64_Box_bounds_from_above :
  uint64_box -> linear_expression -> bool
val ppl_Uint64_Box_bounds_from_below :
  uint64_box -> linear_expression -> bool
val ppl_Uint64_Box_maximize :
  uint64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint64_Box_minimize :
  uint64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint64_Box_maximize_with_point :
  uint64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint64_Box_minimize_with_point :
  uint64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint64_Box_frequency :
  uint64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Uint64_Box_contains_Uint64_Box : uint64_box -> uint64_box -> bool
val ppl_Uint64_Box_strictly_contains_Uint64_Box :
  uint64_box -> uint64_box -> bool
```

```
val ppl_Uint64_Box_is_disjoint_from_Uint64_Box :
  uint64_box -> uint64_box -> bool
val ppl_Uint64_Box_equals_Uint64_Box : uint64_box -> uint64_box -> bool
val ppl_Uint64_Box_OK : uint64_box -> bool
val ppl_Uint64_Box_add_constraint : uint64_box -> linear_constraint -> unit
val ppl_Uint64_Box_add_congruence : uint64_box -> linear_congruence -> unit
val ppl_Uint64_Box_add_constraints : uint64_box -> constraint_system -> unit
val ppl_Uint64_Box_add_congruences : uint64_box -> congruence_system -> unit
val ppl_Uint64_Box_refine_with_constraint :
  uint64_box -> linear_constraint -> unit
val ppl_Uint64_Box_refine_with_congruence :
  uint64_box -> linear_congruence -> unit
val ppl_Uint64_Box_refine_with_constraints :
  uint64_box -> constraint_system -> unit
val ppl_Uint64_Box_refine_with_congruences :
  uint64_box -> congruence_system -> unit
val ppl_Uint64_Box_intersection_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_upper_bound_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_difference_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_concatenate_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_time_elapse_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_upper_bound_assign_if_exact :
  uint64_box -> uint64_box -> bool
val ppl_Uint64_Box_simplify_using_context_assign :
  uint64_box -> uint64_box -> bool
val ppl_Uint64_Box_constrains : uint64_box -> int -> bool
val ppl_Uint64_Box_unconstrain_space_dimension : uint64_box -> int -> unit
val ppl_Uint64_Box_unconstrain_space_dimensions :
  uint64_box -> int list -> unit
val ppl_Uint64_Box_affine_image :
  uint64_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint64_Box_affine_preimage :
  uint64_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint64_Box_bounded_affine_image :
  uint64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint64_Box_bounded_affine_preimage :
  uint64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint64_Box_generalized_affine_image :
  uint64_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint64_Box_generalized_affine_preimage :
  uint64_box ->
  int ->
```

```
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint64_Box_generalized_affine_image_lhs_rhs :
  uint64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint64_Box_generalized_affine_preimage_lhs_rhs :
  uint64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint64_Box_add_space_dimensions_and_embed : uint64_box -> int -> unit
val ppl_Uint64_Box_add_space_dimensions_and_project :
  uint64_box -> int -> unit
val ppl_Uint64_Box_remove_space_dimensions : uint64_box -> int list -> unit
val ppl_Uint64_Box_remove_higher_space_dimensions : uint64_box -> int -> unit
val ppl_Uint64_Box_expand_space_dimension : uint64_box -> int -> int -> unit
val ppl_Uint64_Box_fold_space_dimensions :
  uint64_box -> int list -> int -> unit
val ppl_Uint64_Box_map_space_dimensions :
  uint64_box -> (int * int) list -> unit
val ppl_Uint64_Box_drop_some_non_integer_points :
  uint64_box -> complexity_class -> unit
val ppl_Uint64_Box_drop_some_non_integer_points_2 :
  uint64_box -> int list -> complexity_class -> unit
val ppl_Uint64_Box_ascii_dump : uint64_box -> string
val ppl_Uint64_Box_external_memory_in_bytes : uint64_box -> int
val ppl_Uint64_Box_total_memory_in_bytes : uint64_box -> int
val ppl_Uint64_Box_CC76_widening_assign_with_tokens :
  uint64_box -> uint64_box -> int -> int
val ppl_Uint64_Box_CC76_widening_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_widening_assign_with_tokens :
  uint64_box -> uint64_box -> int -> int
val ppl_Uint64_Box_widening_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_limited_CC76_extrapolation_assign_with_tokens :
  uint64_box ->
  uint64_box -> constraint_system -> int -> int
val ppl_Uint64_Box_limited_CC76_extrapolation_assign :
  uint64_box ->
  uint64_box -> constraint_system -> unit
val ppl_Uint64_Box_linear_partition :
  uint64_box ->
  uint64_box ->
  uint64_box * pointset_powerset_nnc_polyhedron
val ppl_Uint64_Box_wrap_assign :
  uint64_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
```

```
val ppl_termination_test_MS_Uint64_Box : uint64_box -> bool
val ppl_termination_test_PR_Uint64_Box : uint64_box -> bool
val ppl_one_affine_ranking_function_MS_Uint64_Box :
  uint64_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint64_Box :
  uint64_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint64_Box : uint64_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint64_Box : uint64_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint64_Box :
  uint64_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Uint64_Box_2 : uint64_box -> uint64_box -> bool
val ppl_termination_test_PR_Uint64_Box_2 : uint64_box -> uint64_box -> bool
val ppl_one_affine_ranking_function_MS_Uint64_Box_2 :
  uint64_box ->
  uint64_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint64_Box_2 :
  uint64_box ->
  uint64_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint64_Box_2 :
  uint64_box -> uint64_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint64_Box_2 :
  uint64_box -> uint64_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint64_Box_2 :
  uint64_box ->
  uint64_box -> polyhedron * polyhedron
val ppl_new_Z_Box_from_space_dimension : int -> degenerate_element -> z_box
val ppl_new_Z_Box_from_Int8_Box : int8_box -> z_box
val ppl_new_Z_Box_from_Int16_Box : int16_box -> z_box
val ppl_new_Z_Box_from_Int32_Box : int32_box -> z_box
val ppl_new_Z_Box_from_Int64_Box : int64_box -> z_box
val ppl_new_Z_Box_from_Uint8_Box : uint8_box -> z_box
val ppl_new_Z_Box_from_Uint16_Box : uint16_box -> z_box
val ppl_new_Z_Box_from_Uint32_Box : uint32_box -> z_box
val ppl_new_Z_Box_from_Uint64_Box : uint64_box -> z_box
val ppl_new_Z_Box_from_Z_Box : z_box -> z_box
val ppl_new_Z_Box_from_Rational_Box : rational_box -> z_box
val ppl_new_Z_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> z_box
val ppl_new_Z_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> z_box
val ppl_new_Z_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> z_box
val ppl_new_Z_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> z_box
val ppl_new_Z_Box_from_BD_Shape_mpz_class : bd_shape_mpz_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_mpq_class : bd_shape_mpq_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> z_box
```

```
val ppl_new_Z_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> z_box
val ppl_new_Z_Box_from_C_Polyhedron : polyhedron -> z_box
val ppl_new_Z_Box_from_NNC_Polyhedron : polyhedron -> z_box
val ppl_new_Z_Box_from_Grid : grid -> z_box
val ppl_new_Z_Box_from_Float_Box : float_box -> z_box
val ppl_new_Z_Box_from_BD_Shape_float : bd_shape_float -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_float : octagonal_shape_float -> z_box
val ppl_new_Z_Box_from_Double_Box : double_box -> z_box
val ppl_new_Z_Box_from_BD_Shape_double : bd_shape_double -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> z_box
val ppl_new_Z_Box_from_Long_Double_Box : long_double_box -> z_box
val ppl_new_Z_Box_from_BD_Shape_long_double : bd_shape_long_double -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> z_box
val ppl_new_Z_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_int32_t_with_complexity :
```

```
  bd_shape_int32_t -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class -> complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> z_box
val ppl_new_Z_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> z_box
val ppl_new_Z_Box_from_Grid_with_complexity :
  grid -> complexity_class -> z_box
val ppl_new_Z_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double -> complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Long_Double_Box_with_complexity :
  long_double_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
```

```
  complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_constraints : constraint_system -> z_box
val ppl_new_Z_Box_from_congruences : congruence_system -> z_box
val ppl_new_Z_Box_from_generators : generator_system -> z_box
val ppl_Z_Box_swap : z_box -> z_box -> unit
val ppl_Z_Box_space_dimension : z_box -> int
val ppl_Z_Box_affine_dimension : z_box -> int
val ppl_Z_Box_relation_with_constraint :
  z_box ->
  linear_constraint -> poly_con_relation list
val ppl_Z_Box_relation_with_generator :
  z_box ->
  linear_generator -> poly_gen_relation list
val ppl_Z_Box_relation_with_congruence :
  z_box ->
  linear_congruence -> poly_con_relation list
val ppl_Z_Box_get_constraints : z_box -> constraint_system
val ppl_Z_Box_get_congruences : z_box -> congruence_system
val ppl_Z_Box_get_minimized_constraints : z_box -> constraint_system
val ppl_Z_Box_get_minimized_congruences : z_box -> congruence_system
val ppl_Z_Box_is_empty : z_box -> bool
val ppl_Z_Box_is_universe : z_box -> bool
val ppl_Z_Box_is_bounded : z_box -> bool
val ppl_Z_Box_contains_integer_point : z_box -> bool
val ppl_Z_Box_is_topologically_closed : z_box -> bool
val ppl_Z_Box_is_discrete : z_box -> bool
val ppl_Z_Box_topological_closure_assign : z_box -> unit
val ppl_Z_Box_bounds_from_above : z_box -> linear_expression -> bool
val ppl_Z_Box_bounds_from_below : z_box -> linear_expression -> bool
val ppl_Z_Box_maximize :
  z_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Z_Box_minimize :
  z_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Z_Box_maximize_with_point :
  z_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Z_Box_minimize_with_point :
  z_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Z_Box_frequency :
```

```
  z_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Z_Box_contains_Z_Box : z_box -> z_box -> bool
val ppl_Z_Box_strictly_contains_Z_Box : z_box -> z_box -> bool
val ppl_Z_Box_is_disjoint_from_Z_Box : z_box -> z_box -> bool
val ppl_Z_Box_equals_Z_Box : z_box -> z_box -> bool
val ppl_Z_Box_OK : z_box -> bool
val ppl_Z_Box_add_constraint : z_box -> linear_constraint -> unit
val ppl_Z_Box_add_congruence : z_box -> linear_congruence -> unit
val ppl_Z_Box_add_constraints : z_box -> constraint_system -> unit
val ppl_Z_Box_add_congruences : z_box -> congruence_system -> unit
val ppl_Z_Box_refine_with_constraint : z_box -> linear_constraint -> unit
val ppl_Z_Box_refine_with_congruence : z_box -> linear_congruence -> unit
val ppl_Z_Box_refine_with_constraints : z_box -> constraint_system -> unit
val ppl_Z_Box_refine_with_congruences : z_box -> congruence_system -> unit
val ppl_Z_Box_intersection_assign : z_box -> z_box -> unit
val ppl_Z_Box_upper_bound_assign : z_box -> z_box -> unit
val ppl_Z_Box_difference_assign : z_box -> z_box -> unit
val ppl_Z_Box_concatenate_assign : z_box -> z_box -> unit
val ppl_Z_Box_time_elapse_assign : z_box -> z_box -> unit
val ppl_Z_Box_upper_bound_assign_if_exact : z_box -> z_box -> bool
val ppl_Z_Box_simplify_using_context_assign : z_box -> z_box -> bool
val ppl_Z_Box_constrains : z_box -> int -> bool
val ppl_Z_Box_unconstrain_space_dimension : z_box -> int -> unit
val ppl_Z_Box_unconstrain_space_dimensions : z_box -> int list -> unit
val ppl_Z_Box_affine_image :
  z_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Z_Box_affine_preimage :
  z_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Z_Box_bounded_affine_image :
  z_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Z_Box_bounded_affine_preimage :
  z_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Z_Box_generalized_affine_image :
  z_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Z_Box_generalized_affine_preimage :
  z_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Z_Box_generalized_affine_image_lhs_rhs :
  z_box ->
```

```
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Z_Box_generalized_affine_preimage_lhs_rhs :
  z_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Z_Box_add_space_dimensions_and_embed : z_box -> int -> unit
val ppl_Z_Box_add_space_dimensions_and_project : z_box -> int -> unit
val ppl_Z_Box_remove_space_dimensions : z_box -> int list -> unit
val ppl_Z_Box_remove_higher_space_dimensions : z_box -> int -> unit
val ppl_Z_Box_expand_space_dimension : z_box -> int -> int -> unit
val ppl_Z_Box_fold_space_dimensions : z_box -> int list -> int -> unit
val ppl_Z_Box_map_space_dimensions : z_box -> (int * int) list -> unit
val ppl_Z_Box_drop_some_non_integer_points :
  z_box -> complexity_class -> unit
val ppl_Z_Box_drop_some_non_integer_points_2 :
  z_box -> int list -> complexity_class -> unit
val ppl_Z_Box_ascii_dump : z_box -> string
val ppl_Z_Box_external_memory_in_bytes : z_box -> int
val ppl_Z_Box_total_memory_in_bytes : z_box -> int
val ppl_Z_Box_CC76_widening_assign_with_tokens : z_box -> z_box -> int -> int
val ppl_Z_Box_CC76_widening_assign : z_box -> z_box -> unit
val ppl_Z_Box_widening_assign_with_tokens : z_box -> z_box -> int -> int
val ppl_Z_Box_widening_assign : z_box -> z_box -> unit
val ppl_Z_Box_limited_CC76_extrapolation_assign_with_tokens :
  z_box ->
  z_box -> constraint_system -> int -> int
val ppl_Z_Box_limited_CC76_extrapolation_assign :
  z_box -> z_box -> constraint_system -> unit
val ppl_Z_Box_linear_partition :
  z_box ->
  z_box ->
  z_box * pointset_powerset_nnc_polyhedron
val ppl_Z_Box_wrap_assign :
  z_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Z_Box : z_box -> bool
val ppl_termination_test_PR_Z_Box : z_box -> bool
val ppl_one_affine_ranking_function_MS_Z_Box :
  z_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Z_Box :
  z_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Z_Box : z_box -> polyhedron
```

```
val ppl_all_affine_ranking_functions_PR_Z_Box : z_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Z_Box :
  z_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Z_Box_2 : z_box -> z_box -> bool
val ppl_termination_test_PR_Z_Box_2 : z_box -> z_box -> bool
val ppl_one_affine_ranking_function_MS_Z_Box_2 :
  z_box -> z_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Z_Box_2 :
  z_box -> z_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Z_Box_2 :
  z_box -> z_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Z_Box_2 :
  z_box -> z_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Z_Box_2 :
  z_box ->
  z_box -> polyhedron * polyhedron
val ppl_new_Rational_Box_from_space_dimension :
  int -> degenerate_element -> rational_box
val ppl_new_Rational_Box_from_Int8_Box : int8_box -> rational_box
val ppl_new_Rational_Box_from_Int16_Box : int16_box -> rational_box
val ppl_new_Rational_Box_from_Int32_Box : int32_box -> rational_box
val ppl_new_Rational_Box_from_Int64_Box : int64_box -> rational_box
val ppl_new_Rational_Box_from_Uint8_Box : uint8_box -> rational_box
val ppl_new_Rational_Box_from_Uint16_Box : uint16_box -> rational_box
val ppl_new_Rational_Box_from_Uint32_Box : uint32_box -> rational_box
val ppl_new_Rational_Box_from_Uint64_Box : uint64_box -> rational_box
val ppl_new_Rational_Box_from_Z_Box : z_box -> rational_box
val ppl_new_Rational_Box_from_Rational_Box : rational_box -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int8_t :
  bd_shape_int8_t -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int16_t :
  bd_shape_int16_t -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int32_t :
  bd_shape_int32_t -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int64_t :
  bd_shape_int64_t -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int64_t :
```

```
  octagonal_shape_int64_t -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> rational_box
val ppl_new_Rational_Box_from_C_Polyhedron : polyhedron -> rational_box
val ppl_new_Rational_Box_from_NNC_Polyhedron : polyhedron -> rational_box
val ppl_new_Rational_Box_from_Grid : grid -> rational_box
val ppl_new_Rational_Box_from_Float_Box : float_box -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_float : bd_shape_float -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> rational_box
val ppl_new_Rational_Box_from_Double_Box : double_box -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_double :
  bd_shape_double -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> rational_box
val ppl_new_Rational_Box_from_Long_Double_Box :
  long_double_box -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> rational_box
val ppl_new_Rational_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int16_t_with_complexity :
```

```
  bd_shape_int16_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Grid_with_complexity :
  grid -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
```

```
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_constraints : constraint_system -> rational_box
val ppl_new_Rational_Box_from_congruences : congruence_system -> rational_box
val ppl_new_Rational_Box_from_generators : generator_system -> rational_box
val ppl_Rational_Box_swap : rational_box -> rational_box -> unit
val ppl_Rational_Box_space_dimension : rational_box -> int
val ppl_Rational_Box_affine_dimension : rational_box -> int
val ppl_Rational_Box_relation_with_constraint :
  rational_box ->
  linear_constraint -> poly_con_relation list
val ppl_Rational_Box_relation_with_generator :
  rational_box ->
  linear_generator -> poly_gen_relation list
val ppl_Rational_Box_relation_with_congruence :
  rational_box ->
  linear_congruence -> poly_con_relation list
val ppl_Rational_Box_get_constraints : rational_box -> constraint_system
val ppl_Rational_Box_get_congruences : rational_box -> congruence_system
val ppl_Rational_Box_get_minimized_constraints :
  rational_box -> constraint_system
val ppl_Rational_Box_get_minimized_congruences :
  rational_box -> congruence_system
val ppl_Rational_Box_is_empty : rational_box -> bool
val ppl_Rational_Box_is_universe : rational_box -> bool
val ppl_Rational_Box_is_bounded : rational_box -> bool
val ppl_Rational_Box_contains_integer_point : rational_box -> bool
val ppl_Rational_Box_is_topologically_closed : rational_box -> bool
val ppl_Rational_Box_is_discrete : rational_box -> bool
val ppl_Rational_Box_topological_closure_assign : rational_box -> unit
val ppl_Rational_Box_bounds_from_above :
  rational_box -> linear_expression -> bool
val ppl_Rational_Box_bounds_from_below :
  rational_box -> linear_expression -> bool
val ppl_Rational_Box_maximize :
  rational_box ->
```

```
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Rational_Box_minimize :
  rational_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Rational_Box_maximize_with_point :
  rational_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Rational_Box_minimize_with_point :
  rational_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Rational_Box_frequency :
  rational_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Rational_Box_contains_Rational_Box :
  rational_box -> rational_box -> bool
val ppl_Rational_Box_strictly_contains_Rational_Box :
  rational_box -> rational_box -> bool
val ppl_Rational_Box_is_disjoint_from_Rational_Box :
  rational_box -> rational_box -> bool
val ppl_Rational_Box_equals_Rational_Box :
  rational_box -> rational_box -> bool
val ppl_Rational_Box_OK : rational_box -> bool
val ppl_Rational_Box_add_constraint :
  rational_box -> linear_constraint -> unit
val ppl_Rational_Box_add_congruence :
  rational_box -> linear_congruence -> unit
val ppl_Rational_Box_add_constraints :
  rational_box -> constraint_system -> unit
val ppl_Rational_Box_add_congruences :
  rational_box -> congruence_system -> unit
val ppl_Rational_Box_refine_with_constraint :
  rational_box -> linear_constraint -> unit
val ppl_Rational_Box_refine_with_congruence :
  rational_box -> linear_congruence -> unit
val ppl_Rational_Box_refine_with_constraints :
  rational_box -> constraint_system -> unit
val ppl_Rational_Box_refine_with_congruences :
  rational_box -> congruence_system -> unit
val ppl_Rational_Box_intersection_assign :
  rational_box -> rational_box -> unit
val ppl_Rational_Box_upper_bound_assign :
  rational_box -> rational_box -> unit
val ppl_Rational_Box_difference_assign : rational_box -> rational_box -> unit
val ppl_Rational_Box_concatenate_assign :
  rational_box -> rational_box -> unit
val ppl_Rational_Box_time_elapse_assign :
  rational_box -> rational_box -> unit
```

```
val ppl_Rational_Box_upper_bound_assign_if_exact :
  rational_box -> rational_box -> bool
val ppl_Rational_Box_simplify_using_context_assign :
  rational_box -> rational_box -> bool
val ppl_Rational_Box_constrains : rational_box -> int -> bool
val ppl_Rational_Box_unconstrain_space_dimension :
  rational_box -> int -> unit
val ppl_Rational_Box_unconstrain_space_dimensions :
  rational_box -> int list -> unit
val ppl_Rational_Box_affine_image :
  rational_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Rational_Box_affine_preimage :
  rational_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Rational_Box_bounded_affine_image :
  rational_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Rational_Box_bounded_affine_preimage :
  rational_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Rational_Box_generalized_affine_image :
  rational_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Rational_Box_generalized_affine_preimage :
  rational_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Rational_Box_generalized_affine_image_lhs_rhs :
  rational_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Rational_Box_generalized_affine_preimage_lhs_rhs :
  rational_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Rational_Box_add_space_dimensions_and_embed :
  rational_box -> int -> unit
val ppl_Rational_Box_add_space_dimensions_and_project :
  rational_box -> int -> unit
val ppl_Rational_Box_remove_space_dimensions :
  rational_box -> int list -> unit
val ppl_Rational_Box_remove_higher_space_dimensions :
  rational_box -> int -> unit
val ppl_Rational_Box_expand_space_dimension :
  rational_box -> int -> int -> unit
val ppl_Rational_Box_fold_space_dimensions :
```

```
  rational_box -> int list -> int -> unit
val ppl_Rational_Box_map_space_dimensions :
  rational_box -> (int * int) list -> unit
val ppl_Rational_Box_drop_some_non_integer_points :
  rational_box -> complexity_class -> unit
val ppl_Rational_Box_drop_some_non_integer_points_2 :
  rational_box -> int list -> complexity_class -> unit
val ppl_Rational_Box_ascii_dump : rational_box -> string
val ppl_Rational_Box_external_memory_in_bytes : rational_box -> int
val ppl_Rational_Box_total_memory_in_bytes : rational_box -> int
val ppl_Rational_Box_CC76_widening_assign_with_tokens :
  rational_box -> rational_box -> int -> int
val ppl_Rational_Box_CC76_widening_assign :
  rational_box -> rational_box -> unit
val ppl_Rational_Box_widening_assign_with_tokens :
  rational_box -> rational_box -> int -> int
val ppl_Rational_Box_widening_assign : rational_box -> rational_box -> unit
val ppl_Rational_Box_limited_CC76_extrapolation_assign_with_tokens :
  rational_box ->
  rational_box -> constraint_system -> int -> int
val ppl_Rational_Box_limited_CC76_extrapolation_assign :
  rational_box ->
  rational_box -> constraint_system -> unit
val ppl_Rational_Box_linear_partition :
  rational_box ->
  rational_box ->
  rational_box * pointset_powerset_nnc_polyhedron
val ppl_Rational_Box_wrap_assign :
  rational_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Rational_Box : rational_box -> bool
val ppl_termination_test_PR_Rational_Box : rational_box -> bool
val ppl_one_affine_ranking_function_MS_Rational_Box :
  rational_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Rational_Box :
  rational_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Rational_Box :
  rational_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Rational_Box :
  rational_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Rational_Box :
  rational_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Rational_Box_2 :
  rational_box -> rational_box -> bool
```

```
val ppl_termination_test_PR_Rational_Box_2 :
  rational_box -> rational_box -> bool
val ppl_one_affine_ranking_function_MS_Rational_Box_2 :
  rational_box ->
  rational_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Rational_Box_2 :
  rational_box ->
  rational_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Rational_Box_2 :
  rational_box -> rational_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Rational_Box_2 :
  rational_box -> rational_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Rational_Box_2 :
  rational_box ->
  rational_box -> polyhedron * polyhedron
val ppl_new_BD_Shape_int8_t_from_space_dimension :
  int -> degenerate_element -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int8_Box : int8_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int16_Box : int16_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int32_Box : int32_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int64_Box : int64_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint8_Box : uint8_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint16_Box : uint16_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint32_Box : uint32_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint64_Box : uint64_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Z_Box : z_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Rational_Box :
  rational_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_int8_t
```

```
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_C_Polyhedron : polyhedron -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_NNC_Polyhedron :
  polyhedron -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Grid : grid -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Float_Box : float_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_float :
  bd_shape_float -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Double_Box : double_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_double :
  bd_shape_double -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Long_Double_Box :
  long_double_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_int8_t
```

```
val ppl_new_BD_Shape_int8_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_int8_t
```

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val ppl_new_BD_Shape_int8_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_constraints :
  constraint_system -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_congruences :
  congruence_system -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_generators :
  generator_system -> bd_shape_int8_t
val ppl_BD_Shape_int8_t_swap : bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_space_dimension : bd_shape_int8_t -> int
val ppl_BD_Shape_int8_t_affine_dimension : bd_shape_int8_t -> int
val ppl_BD_Shape_int8_t_relation_with_constraint :
  bd_shape_int8_t ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_int8_t_relation_with_generator :
  bd_shape_int8_t ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_int8_t_relation_with_congruence :
  bd_shape_int8_t ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_int8_t_get_constraints :
  bd_shape_int8_t -> constraint_system
val ppl_BD_Shape_int8_t_get_congruences :
  bd_shape_int8_t -> congruence_system
val ppl_BD_Shape_int8_t_get_minimized_constraints :
  bd_shape_int8_t -> constraint_system
val ppl_BD_Shape_int8_t_get_minimized_congruences :
```

```
  bd_shape_int8_t -> congruence_system
val ppl_BD_Shape_int8_t_is_empty : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_is_universe : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_is_bounded : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_contains_integer_point : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_is_topologically_closed : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_is_discrete : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_topological_closure_assign : bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_bounds_from_above :
  bd_shape_int8_t -> linear_expression -> bool
val ppl_BD_Shape_int8_t_bounds_from_below :
  bd_shape_int8_t -> linear_expression -> bool
val ppl_BD_Shape_int8_t_maximize :
  bd_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int8_t_minimize :
  bd_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int8_t_maximize_with_point :
  bd_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int8_t_minimize_with_point :
  bd_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int8_t_frequency :
  bd_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_int8_t_contains_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_strictly_contains_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_is_disjoint_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_equals_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_OK : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_add_constraint :
  bd_shape_int8_t -> linear_constraint -> unit
val ppl_BD_Shape_int8_t_add_congruence :
  bd_shape_int8_t -> linear_congruence -> unit
val ppl_BD_Shape_int8_t_add_constraints :
  bd_shape_int8_t -> constraint_system -> unit
val ppl_BD_Shape_int8_t_add_congruences :
  bd_shape_int8_t -> congruence_system -> unit
val ppl_BD_Shape_int8_t_refine_with_constraint :
  bd_shape_int8_t -> linear_constraint -> unit
```

```
val ppl_BD_Shape_int8_t_refine_with_congruence :
  bd_shape_int8_t -> linear_congruence -> unit
val ppl_BD_Shape_int8_t_refine_with_constraints :
  bd_shape_int8_t -> constraint_system -> unit
val ppl_BD_Shape_int8_t_refine_with_congruences :
  bd_shape_int8_t -> congruence_system -> unit
val ppl_BD_Shape_int8_t_intersection_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_upper_bound_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_difference_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_concatenate_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_time_elapse_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_upper_bound_assign_if_exact :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_simplify_using_context_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_constrains : bd_shape_int8_t -> int -> bool
val ppl_BD_Shape_int8_t_unconstrain_space_dimension :
  bd_shape_int8_t -> int -> unit
val ppl_BD_Shape_int8_t_unconstrain_space_dimensions :
  bd_shape_int8_t -> int list -> unit
val ppl_BD_Shape_int8_t_affine_image :
  bd_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int8_t_affine_preimage :
  bd_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int8_t_bounded_affine_image :
  bd_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int8_t_bounded_affine_preimage :
  bd_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int8_t_generalized_affine_image :
  bd_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int8_t_generalized_affine_preimage :
  bd_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int8_t_generalized_affine_image_lhs_rhs :
  bd_shape_int8_t ->
```

```
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int8_t_generalized_affine_preimage_lhs_rhs :
  bd_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int8_t_add_space_dimensions_and_embed :
  bd_shape_int8_t -> int -> unit
val ppl_BD_Shape_int8_t_add_space_dimensions_and_project :
  bd_shape_int8_t -> int -> unit
val ppl_BD_Shape_int8_t_remove_space_dimensions :
  bd_shape_int8_t -> int list -> unit
val ppl_BD_Shape_int8_t_remove_higher_space_dimensions :
  bd_shape_int8_t -> int -> unit
val ppl_BD_Shape_int8_t_expand_space_dimension :
  bd_shape_int8_t -> int -> int -> unit
val ppl_BD_Shape_int8_t_fold_space_dimensions :
  bd_shape_int8_t -> int list -> int -> unit
val ppl_BD_Shape_int8_t_map_space_dimensions :
  bd_shape_int8_t -> (int * int) list -> unit
val ppl_BD_Shape_int8_t_drop_some_non_integer_points :
  bd_shape_int8_t -> complexity_class -> unit
val ppl_BD_Shape_int8_t_drop_some_non_integer_points_2 :
  bd_shape_int8_t -> int list -> complexity_class -> unit
val ppl_BD_Shape_int8_t_ascii_dump : bd_shape_int8_t -> string
val ppl_BD_Shape_int8_t_external_memory_in_bytes : bd_shape_int8_t -> int
val ppl_BD_Shape_int8_t_total_memory_in_bytes : bd_shape_int8_t -> int
val ppl_BD_Shape_int8_t_BHMZ05_widening_assign_with_tokens :
  bd_shape_int8_t -> bd_shape_int8_t -> int -> int
val ppl_BD_Shape_int8_t_H79_widening_assign_with_tokens :
  bd_shape_int8_t -> bd_shape_int8_t -> int -> int
val ppl_BD_Shape_int8_t_BHMZ05_widening_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_H79_widening_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_widening_assign_with_tokens :
  bd_shape_int8_t -> bd_shape_int8_t -> int -> int
val ppl_BD_Shape_int8_t_widening_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_int8_t ->
  bd_shape_int8_t -> constraint_system -> int -> int
val ppl_BD_Shape_int8_t_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_int8_t ->
  bd_shape_int8_t -> constraint_system -> int -> int
val ppl_BD_Shape_int8_t_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_int8_t ->
  bd_shape_int8_t -> constraint_system -> int -> int
```

```
val ppl_BD_Shape_int8_t_limited_BHMZ05_extrapolation_assign :
  bd_shape_int8_t ->
  bd_shape_int8_t -> constraint_system -> unit
val ppl_BD_Shape_int8_t_limited_H79_extrapolation_assign :
  bd_shape_int8_t ->
  bd_shape_int8_t -> constraint_system -> unit
val ppl_BD_Shape_int8_t_limited_CC76_extrapolation_assign :
  bd_shape_int8_t ->
  bd_shape_int8_t -> constraint_system -> unit
val ppl_BD_Shape_int8_t_CC76_extrapolation_assign_with_tokens :
  bd_shape_int8_t -> bd_shape_int8_t -> int -> int
val ppl_BD_Shape_int8_t_CC76_extrapolation_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_CC76_narrowing_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_linear_partition :
  bd_shape_int8_t ->
  bd_shape_int8_t ->
  bd_shape_int8_t * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_int8_t_wrap_assign :
  bd_shape_int8_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_int8_t : bd_shape_int8_t -> bool
val ppl_termination_test_PR_BD_Shape_int8_t : bd_shape_int8_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int8_t :
  bd_shape_int8_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int8_t :
  bd_shape_int8_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int8_t :
  bd_shape_int8_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int8_t :
  bd_shape_int8_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int8_t :
  bd_shape_int8_t -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_int8_t_2 :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_termination_test_PR_BD_Shape_int8_t_2 :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int8_t_2 :
  bd_shape_int8_t ->
  bd_shape_int8_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int8_t_2 :
  bd_shape_int8_t ->
  bd_shape_int8_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int8_t_2 :
```

```
  bd_shape_int8_t ->
  bd_shape_int8_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int8_t_2 :
  bd_shape_int8_t ->
  bd_shape_int8_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int8_t_2 :
  bd_shape_int8_t ->
  bd_shape_int8_t -> polyhedron * polyhedron
val ppl_new_BD_Shape_int16_t_from_space_dimension :
  int -> degenerate_element -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int8_Box : int8_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int16_Box : int16_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int32_Box : int32_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int64_Box : int64_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint8_Box : uint8_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint16_Box : uint16_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint32_Box : uint32_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint64_Box : uint64_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Z_Box : z_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Rational_Box :
  rational_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_C_Polyhedron :
  polyhedron -> bd_shape_int16_t
```

```
val ppl_new_BD_Shape_int16_t_from_NNC_Polyhedron :
  polyhedron -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Grid : grid -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Float_Box : float_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_float :
  bd_shape_float -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Double_Box : double_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_double :
  bd_shape_double -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Long_Double_Box :
  long_double_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int8_t_with_complexity :
```

```
  bd_shape_int8_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_float_with_complexity :
```

```
  octagonal_shape_float ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_constraints :
  constraint_system -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_congruences :
  congruence_system -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_generators :
  generator_system -> bd_shape_int16_t
val ppl_BD_Shape_int16_t_swap : bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_space_dimension : bd_shape_int16_t -> int
val ppl_BD_Shape_int16_t_affine_dimension : bd_shape_int16_t -> int
val ppl_BD_Shape_int16_t_relation_with_constraint :
  bd_shape_int16_t ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_int16_t_relation_with_generator :
  bd_shape_int16_t ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_int16_t_relation_with_congruence :
  bd_shape_int16_t ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_int16_t_get_constraints :
  bd_shape_int16_t -> constraint_system
val ppl_BD_Shape_int16_t_get_congruences :
  bd_shape_int16_t -> congruence_system
val ppl_BD_Shape_int16_t_get_minimized_constraints :
  bd_shape_int16_t -> constraint_system
val ppl_BD_Shape_int16_t_get_minimized_congruences :
  bd_shape_int16_t -> congruence_system
val ppl_BD_Shape_int16_t_is_empty : bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_is_universe : bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_is_bounded : bd_shape_int16_t -> bool
```

```
val ppl_BD_Shape_int16_t_contains_integer_point : bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_is_topologically_closed : bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_is_discrete : bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_topological_closure_assign :
  bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_bounds_from_above :
  bd_shape_int16_t -> linear_expression -> bool
val ppl_BD_Shape_int16_t_bounds_from_below :
  bd_shape_int16_t -> linear_expression -> bool
val ppl_BD_Shape_int16_t_maximize :
  bd_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int16_t_minimize :
  bd_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int16_t_maximize_with_point :
  bd_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int16_t_minimize_with_point :
  bd_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int16_t_frequency :
  bd_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_int16_t_contains_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_strictly_contains_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_is_disjoint_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_equals_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_OK : bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_add_constraint :
  bd_shape_int16_t -> linear_constraint -> unit
val ppl_BD_Shape_int16_t_add_congruence :
  bd_shape_int16_t -> linear_congruence -> unit
val ppl_BD_Shape_int16_t_add_constraints :
  bd_shape_int16_t -> constraint_system -> unit
val ppl_BD_Shape_int16_t_add_congruences :
  bd_shape_int16_t -> congruence_system -> unit
val ppl_BD_Shape_int16_t_refine_with_constraint :
  bd_shape_int16_t -> linear_constraint -> unit
val ppl_BD_Shape_int16_t_refine_with_congruence :
  bd_shape_int16_t -> linear_congruence -> unit
val ppl_BD_Shape_int16_t_refine_with_constraints :
  bd_shape_int16_t -> constraint_system -> unit
```

```
val ppl_BD_Shape_int16_t_refine_with_congruences :
  bd_shape_int16_t -> congruence_system -> unit
val ppl_BD_Shape_int16_t_intersection_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_upper_bound_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_difference_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_concatenate_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_time_elapse_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_upper_bound_assign_if_exact :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_simplify_using_context_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_constrains : bd_shape_int16_t -> int -> bool
val ppl_BD_Shape_int16_t_unconstrain_space_dimension :
  bd_shape_int16_t -> int -> unit
val ppl_BD_Shape_int16_t_unconstrain_space_dimensions :
  bd_shape_int16_t -> int list -> unit
val ppl_BD_Shape_int16_t_affine_image :
  bd_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int16_t_affine_preimage :
  bd_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int16_t_bounded_affine_image :
  bd_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int16_t_bounded_affine_preimage :
  bd_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int16_t_generalized_affine_image :
  bd_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int16_t_generalized_affine_preimage :
  bd_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int16_t_generalized_affine_image_lhs_rhs :
  bd_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int16_t_generalized_affine_preimage_lhs_rhs :
  bd_shape_int16_t ->
  linear_expression ->
```

```
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int16_t_add_space_dimensions_and_embed :
  bd_shape_int16_t -> int -> unit
val ppl_BD_Shape_int16_t_add_space_dimensions_and_project :
  bd_shape_int16_t -> int -> unit
val ppl_BD_Shape_int16_t_remove_space_dimensions :
  bd_shape_int16_t -> int list -> unit
val ppl_BD_Shape_int16_t_remove_higher_space_dimensions :
  bd_shape_int16_t -> int -> unit
val ppl_BD_Shape_int16_t_expand_space_dimension :
  bd_shape_int16_t -> int -> int -> unit
val ppl_BD_Shape_int16_t_fold_space_dimensions :
  bd_shape_int16_t -> int list -> int -> unit
val ppl_BD_Shape_int16_t_map_space_dimensions :
  bd_shape_int16_t -> (int * int) list -> unit
val ppl_BD_Shape_int16_t_drop_some_non_integer_points :
  bd_shape_int16_t -> complexity_class -> unit
val ppl_BD_Shape_int16_t_drop_some_non_integer_points_2 :
  bd_shape_int16_t -> int list -> complexity_class -> unit
val ppl_BD_Shape_int16_t_ascii_dump : bd_shape_int16_t -> string
val ppl_BD_Shape_int16_t_external_memory_in_bytes : bd_shape_int16_t -> int
val ppl_BD_Shape_int16_t_total_memory_in_bytes : bd_shape_int16_t -> int
val ppl_BD_Shape_int16_t_BHMZ05_widening_assign_with_tokens :
  bd_shape_int16_t -> bd_shape_int16_t -> int -> int
val ppl_BD_Shape_int16_t_H79_widening_assign_with_tokens :
  bd_shape_int16_t -> bd_shape_int16_t -> int -> int
val ppl_BD_Shape_int16_t_BHMZ05_widening_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_H79_widening_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_widening_assign_with_tokens :
  bd_shape_int16_t -> bd_shape_int16_t -> int -> int
val ppl_BD_Shape_int16_t_widening_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_int16_t ->
  bd_shape_int16_t -> constraint_system -> int -> int
val ppl_BD_Shape_int16_t_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_int16_t ->
  bd_shape_int16_t -> constraint_system -> int -> int
val ppl_BD_Shape_int16_t_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_int16_t ->
  bd_shape_int16_t -> constraint_system -> int -> int
val ppl_BD_Shape_int16_t_limited_BHMZ05_extrapolation_assign :
  bd_shape_int16_t ->
  bd_shape_int16_t -> constraint_system -> unit
val ppl_BD_Shape_int16_t_limited_H79_extrapolation_assign :
  bd_shape_int16_t ->
```

```
  bd_shape_int16_t -> constraint_system -> unit
val ppl_BD_Shape_int16_t_limited_CC76_extrapolation_assign :
  bd_shape_int16_t ->
  bd_shape_int16_t -> constraint_system -> unit
val ppl_BD_Shape_int16_t_CC76_extrapolation_assign_with_tokens :
  bd_shape_int16_t -> bd_shape_int16_t -> int -> int
val ppl_BD_Shape_int16_t_CC76_extrapolation_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_CC76_narrowing_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_linear_partition :
  bd_shape_int16_t ->
  bd_shape_int16_t ->
  bd_shape_int16_t * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_int16_t_wrap_assign :
  bd_shape_int16_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_int16_t : bd_shape_int16_t -> bool
val ppl_termination_test_PR_BD_Shape_int16_t : bd_shape_int16_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int16_t :
  bd_shape_int16_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int16_t :
  bd_shape_int16_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int16_t :
  bd_shape_int16_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int16_t :
  bd_shape_int16_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int16_t :
  bd_shape_int16_t -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_int16_t_2 :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_termination_test_PR_BD_Shape_int16_t_2 :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int16_t_2 :
  bd_shape_int16_t ->
  bd_shape_int16_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int16_t_2 :
  bd_shape_int16_t ->
  bd_shape_int16_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int16_t_2 :
  bd_shape_int16_t ->
  bd_shape_int16_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int16_t_2 :
  bd_shape_int16_t ->
  bd_shape_int16_t -> polyhedron
```

```
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int16_t_2 :
  bd_shape_int16_t ->
  bd_shape_int16_t -> polyhedron * polyhedron
val ppl_new_BD_Shape_int32_t_from_space_dimension :
  int -> degenerate_element -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int8_Box : int8_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int16_Box : int16_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int32_Box : int32_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int64_Box : int64_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint8_Box : uint8_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint16_Box : uint16_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint32_Box : uint32_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint64_Box : uint64_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Z_Box : z_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Rational_Box :
  rational_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_C_Polyhedron :
  polyhedron -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_NNC_Polyhedron :
  polyhedron -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Grid : grid -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Float_Box : float_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_float :
```

```
  bd_shape_float -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Double_Box : double_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_double :
  bd_shape_double -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Long_Double_Box :
  long_double_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_int32_t
```

```
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_int32_t
```

```
val ppl_new_BD_Shape_int32_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_constraints :
  constraint_system -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_congruences :
  congruence_system -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_generators :
  generator_system -> bd_shape_int32_t
val ppl_BD_Shape_int32_t_swap : bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_space_dimension : bd_shape_int32_t -> int
val ppl_BD_Shape_int32_t_affine_dimension : bd_shape_int32_t -> int
val ppl_BD_Shape_int32_t_relation_with_constraint :
  bd_shape_int32_t ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_int32_t_relation_with_generator :
  bd_shape_int32_t ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_int32_t_relation_with_congruence :
  bd_shape_int32_t ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_int32_t_get_constraints :
  bd_shape_int32_t -> constraint_system
val ppl_BD_Shape_int32_t_get_congruences :
  bd_shape_int32_t -> congruence_system
val ppl_BD_Shape_int32_t_get_minimized_constraints :
  bd_shape_int32_t -> constraint_system
val ppl_BD_Shape_int32_t_get_minimized_congruences :
  bd_shape_int32_t -> congruence_system
val ppl_BD_Shape_int32_t_is_empty : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_is_universe : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_is_bounded : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_contains_integer_point : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_is_topologically_closed : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_is_discrete : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_topological_closure_assign :
```

```
  bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_bounds_from_above :
  bd_shape_int32_t -> linear_expression -> bool
val ppl_BD_Shape_int32_t_bounds_from_below :
  bd_shape_int32_t -> linear_expression -> bool
val ppl_BD_Shape_int32_t_maximize :
  bd_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int32_t_minimize :
  bd_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int32_t_maximize_with_point :
  bd_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int32_t_minimize_with_point :
  bd_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int32_t_frequency :
  bd_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_int32_t_contains_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_strictly_contains_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_is_disjoint_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_equals_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_OK : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_add_constraint :
  bd_shape_int32_t -> linear_constraint -> unit
val ppl_BD_Shape_int32_t_add_congruence :
  bd_shape_int32_t -> linear_congruence -> unit
val ppl_BD_Shape_int32_t_add_constraints :
  bd_shape_int32_t -> constraint_system -> unit
val ppl_BD_Shape_int32_t_add_congruences :
  bd_shape_int32_t -> congruence_system -> unit
val ppl_BD_Shape_int32_t_refine_with_constraint :
  bd_shape_int32_t -> linear_constraint -> unit
val ppl_BD_Shape_int32_t_refine_with_congruence :
  bd_shape_int32_t -> linear_congruence -> unit
val ppl_BD_Shape_int32_t_refine_with_constraints :
  bd_shape_int32_t -> constraint_system -> unit
val ppl_BD_Shape_int32_t_refine_with_congruences :
  bd_shape_int32_t -> congruence_system -> unit
val ppl_BD_Shape_int32_t_intersection_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
```

```
val ppl_BD_Shape_int32_t_upper_bound_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_difference_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_concatenate_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_time_elapse_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_upper_bound_assign_if_exact :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_simplify_using_context_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_constrains : bd_shape_int32_t -> int -> bool
val ppl_BD_Shape_int32_t_unconstrain_space_dimension :
  bd_shape_int32_t -> int -> unit
val ppl_BD_Shape_int32_t_unconstrain_space_dimensions :
  bd_shape_int32_t -> int list -> unit
val ppl_BD_Shape_int32_t_affine_image :
  bd_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int32_t_affine_preimage :
  bd_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int32_t_bounded_affine_image :
  bd_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int32_t_bounded_affine_preimage :
  bd_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int32_t_generalized_affine_image :
  bd_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int32_t_generalized_affine_preimage :
  bd_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int32_t_generalized_affine_image_lhs_rhs :
  bd_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int32_t_generalized_affine_preimage_lhs_rhs :
  bd_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int32_t_add_space_dimensions_and_embed :
  bd_shape_int32_t -> int -> unit
val ppl_BD_Shape_int32_t_add_space_dimensions_and_project :
```

```
  bd_shape_int32_t -> int -> unit
val ppl_BD_Shape_int32_t_remove_space_dimensions :
  bd_shape_int32_t -> int list -> unit
val ppl_BD_Shape_int32_t_remove_higher_space_dimensions :
  bd_shape_int32_t -> int -> unit
val ppl_BD_Shape_int32_t_expand_space_dimension :
  bd_shape_int32_t -> int -> int -> unit
val ppl_BD_Shape_int32_t_fold_space_dimensions :
  bd_shape_int32_t -> int list -> int -> unit
val ppl_BD_Shape_int32_t_map_space_dimensions :
  bd_shape_int32_t -> (int * int) list -> unit
val ppl_BD_Shape_int32_t_drop_some_non_integer_points :
  bd_shape_int32_t -> complexity_class -> unit
val ppl_BD_Shape_int32_t_drop_some_non_integer_points_2 :
  bd_shape_int32_t -> int list -> complexity_class -> unit
val ppl_BD_Shape_int32_t_ascii_dump : bd_shape_int32_t -> string
val ppl_BD_Shape_int32_t_external_memory_in_bytes : bd_shape_int32_t -> int
val ppl_BD_Shape_int32_t_total_memory_in_bytes : bd_shape_int32_t -> int
val ppl_BD_Shape_int32_t_BHMZ05_widening_assign_with_tokens :
  bd_shape_int32_t -> bd_shape_int32_t -> int -> int
val ppl_BD_Shape_int32_t_H79_widening_assign_with_tokens :
  bd_shape_int32_t -> bd_shape_int32_t -> int -> int
val ppl_BD_Shape_int32_t_BHMZ05_widening_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_H79_widening_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_widening_assign_with_tokens :
  bd_shape_int32_t -> bd_shape_int32_t -> int -> int
val ppl_BD_Shape_int32_t_widening_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_int32_t ->
  bd_shape_int32_t -> constraint_system -> int -> int
val ppl_BD_Shape_int32_t_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_int32_t ->
  bd_shape_int32_t -> constraint_system -> int -> int
val ppl_BD_Shape_int32_t_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_int32_t ->
  bd_shape_int32_t -> constraint_system -> int -> int
val ppl_BD_Shape_int32_t_limited_BHMZ05_extrapolation_assign :
  bd_shape_int32_t ->
  bd_shape_int32_t -> constraint_system -> unit
val ppl_BD_Shape_int32_t_limited_H79_extrapolation_assign :
  bd_shape_int32_t ->
  bd_shape_int32_t -> constraint_system -> unit
val ppl_BD_Shape_int32_t_limited_CC76_extrapolation_assign :
  bd_shape_int32_t ->
  bd_shape_int32_t -> constraint_system -> unit
```

```
val ppl_BD_Shape_int32_t_CC76_extrapolation_assign_with_tokens :
  bd_shape_int32_t -> bd_shape_int32_t -> int -> int
val ppl_BD_Shape_int32_t_CC76_extrapolation_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_CC76_narrowing_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_linear_partition :
  bd_shape_int32_t ->
  bd_shape_int32_t ->
  bd_shape_int32_t * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_int32_t_wrap_assign :
  bd_shape_int32_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_int32_t : bd_shape_int32_t -> bool
val ppl_termination_test_PR_BD_Shape_int32_t : bd_shape_int32_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int32_t :
  bd_shape_int32_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int32_t :
  bd_shape_int32_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int32_t :
  bd_shape_int32_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int32_t :
  bd_shape_int32_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int32_t :
  bd_shape_int32_t -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_int32_t_2 :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_termination_test_PR_BD_Shape_int32_t_2 :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int32_t_2 :
  bd_shape_int32_t ->
  bd_shape_int32_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int32_t_2 :
  bd_shape_int32_t ->
  bd_shape_int32_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int32_t_2 :
  bd_shape_int32_t ->
  bd_shape_int32_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int32_t_2 :
  bd_shape_int32_t ->
  bd_shape_int32_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int32_t_2 :
  bd_shape_int32_t ->
  bd_shape_int32_t -> polyhedron * polyhedron
val ppl_new_BD_Shape_int64_t_from_space_dimension :
```

```
  int -> degenerate_element -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int8_Box : int8_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int16_Box : int16_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int32_Box : int32_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int64_Box : int64_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint8_Box : uint8_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint16_Box : uint16_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint32_Box : uint32_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint64_Box : uint64_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Z_Box : z_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Rational_Box :
  rational_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_C_Polyhedron :
  polyhedron -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_NNC_Polyhedron :
  polyhedron -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Grid : grid -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Float_Box : float_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_float :
  bd_shape_float -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Double_Box : double_box -> bd_shape_int64_t
```

```
val ppl_new_BD_Shape_int64_t_from_BD_Shape_double :
  bd_shape_double -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Long_Double_Box :
  long_double_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
```

```
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
```

```
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_constraints :
  constraint_system -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_congruences :
  congruence_system -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_generators :
  generator_system -> bd_shape_int64_t
val ppl_BD_Shape_int64_t_swap : bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_space_dimension : bd_shape_int64_t -> int
val ppl_BD_Shape_int64_t_affine_dimension : bd_shape_int64_t -> int
val ppl_BD_Shape_int64_t_relation_with_constraint :
  bd_shape_int64_t ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_int64_t_relation_with_generator :
  bd_shape_int64_t ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_int64_t_relation_with_congruence :
  bd_shape_int64_t ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_int64_t_get_constraints :
  bd_shape_int64_t -> constraint_system
val ppl_BD_Shape_int64_t_get_congruences :
  bd_shape_int64_t -> congruence_system
val ppl_BD_Shape_int64_t_get_minimized_constraints :
  bd_shape_int64_t -> constraint_system
val ppl_BD_Shape_int64_t_get_minimized_congruences :
  bd_shape_int64_t -> congruence_system
val ppl_BD_Shape_int64_t_is_empty : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_is_universe : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_is_bounded : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_contains_integer_point : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_is_topologically_closed : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_is_discrete : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_topological_closure_assign :
  bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_bounds_from_above :
  bd_shape_int64_t -> linear_expression -> bool
val ppl_BD_Shape_int64_t_bounds_from_below :
  bd_shape_int64_t -> linear_expression -> bool
```

```
val ppl_BD_Shape_int64_t_maximize :
  bd_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int64_t_minimize :
  bd_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int64_t_maximize_with_point :
  bd_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int64_t_minimize_with_point :
  bd_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int64_t_frequency :
  bd_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_int64_t_contains_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_strictly_contains_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_is_disjoint_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_equals_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_OK : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_add_constraint :
  bd_shape_int64_t -> linear_constraint -> unit
val ppl_BD_Shape_int64_t_add_congruence :
  bd_shape_int64_t -> linear_congruence -> unit
val ppl_BD_Shape_int64_t_add_constraints :
  bd_shape_int64_t -> constraint_system -> unit
val ppl_BD_Shape_int64_t_add_congruences :
  bd_shape_int64_t -> congruence_system -> unit
val ppl_BD_Shape_int64_t_refine_with_constraint :
  bd_shape_int64_t -> linear_constraint -> unit
val ppl_BD_Shape_int64_t_refine_with_congruence :
  bd_shape_int64_t -> linear_congruence -> unit
val ppl_BD_Shape_int64_t_refine_with_constraints :
  bd_shape_int64_t -> constraint_system -> unit
val ppl_BD_Shape_int64_t_refine_with_congruences :
  bd_shape_int64_t -> congruence_system -> unit
val ppl_BD_Shape_int64_t_intersection_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_upper_bound_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_difference_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_concatenate_assign :
```

```
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_time_elapse_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_upper_bound_assign_if_exact :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_simplify_using_context_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_constrains : bd_shape_int64_t -> int -> bool
val ppl_BD_Shape_int64_t_unconstrain_space_dimension :
  bd_shape_int64_t -> int -> unit
val ppl_BD_Shape_int64_t_unconstrain_space_dimensions :
  bd_shape_int64_t -> int list -> unit
val ppl_BD_Shape_int64_t_affine_image :
  bd_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int64_t_affine_preimage :
  bd_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int64_t_bounded_affine_image :
  bd_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int64_t_bounded_affine_preimage :
  bd_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int64_t_generalized_affine_image :
  bd_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int64_t_generalized_affine_preimage :
  bd_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int64_t_generalized_affine_image_lhs_rhs :
  bd_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int64_t_generalized_affine_preimage_lhs_rhs :
  bd_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int64_t_add_space_dimensions_and_embed :
  bd_shape_int64_t -> int -> unit
val ppl_BD_Shape_int64_t_add_space_dimensions_and_project :
  bd_shape_int64_t -> int -> unit
val ppl_BD_Shape_int64_t_remove_space_dimensions :
  bd_shape_int64_t -> int list -> unit
val ppl_BD_Shape_int64_t_remove_higher_space_dimensions :
  bd_shape_int64_t -> int -> unit
```

```
val ppl_BD_Shape_int64_t_expand_space_dimension :
  bd_shape_int64_t -> int -> int -> unit
val ppl_BD_Shape_int64_t_fold_space_dimensions :
  bd_shape_int64_t -> int list -> int -> unit
val ppl_BD_Shape_int64_t_map_space_dimensions :
  bd_shape_int64_t -> (int * int) list -> unit
val ppl_BD_Shape_int64_t_drop_some_non_integer_points :
  bd_shape_int64_t -> complexity_class -> unit
val ppl_BD_Shape_int64_t_drop_some_non_integer_points_2 :
  bd_shape_int64_t -> int list -> complexity_class -> unit
val ppl_BD_Shape_int64_t_ascii_dump : bd_shape_int64_t -> string
val ppl_BD_Shape_int64_t_external_memory_in_bytes : bd_shape_int64_t -> int
val ppl_BD_Shape_int64_t_total_memory_in_bytes : bd_shape_int64_t -> int
val ppl_BD_Shape_int64_t_BHMZ05_widening_assign_with_tokens :
  bd_shape_int64_t -> bd_shape_int64_t -> int -> int
val ppl_BD_Shape_int64_t_H79_widening_assign_with_tokens :
  bd_shape_int64_t -> bd_shape_int64_t -> int -> int
val ppl_BD_Shape_int64_t_BHMZ05_widening_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_H79_widening_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_widening_assign_with_tokens :
  bd_shape_int64_t -> bd_shape_int64_t -> int -> int
val ppl_BD_Shape_int64_t_widening_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_int64_t ->
  bd_shape_int64_t -> constraint_system -> int -> int
val ppl_BD_Shape_int64_t_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_int64_t ->
  bd_shape_int64_t -> constraint_system -> int -> int
val ppl_BD_Shape_int64_t_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_int64_t ->
  bd_shape_int64_t -> constraint_system -> int -> int
val ppl_BD_Shape_int64_t_limited_BHMZ05_extrapolation_assign :
  bd_shape_int64_t ->
  bd_shape_int64_t -> constraint_system -> unit
val ppl_BD_Shape_int64_t_limited_H79_extrapolation_assign :
  bd_shape_int64_t ->
  bd_shape_int64_t -> constraint_system -> unit
val ppl_BD_Shape_int64_t_limited_CC76_extrapolation_assign :
  bd_shape_int64_t ->
  bd_shape_int64_t -> constraint_system -> unit
val ppl_BD_Shape_int64_t_CC76_extrapolation_assign_with_tokens :
  bd_shape_int64_t -> bd_shape_int64_t -> int -> int
val ppl_BD_Shape_int64_t_CC76_extrapolation_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_CC76_narrowing_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
```

```
val ppl_BD_Shape_int64_t_linear_partition :
  bd_shape_int64_t ->
  bd_shape_int64_t ->
  bd_shape_int64_t * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_int64_t_wrap_assign :
  bd_shape_int64_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_int64_t : bd_shape_int64_t -> bool
val ppl_termination_test_PR_BD_Shape_int64_t : bd_shape_int64_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int64_t :
  bd_shape_int64_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int64_t :
  bd_shape_int64_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int64_t :
  bd_shape_int64_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int64_t :
  bd_shape_int64_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int64_t :
  bd_shape_int64_t -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_int64_t_2 :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_termination_test_PR_BD_Shape_int64_t_2 :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int64_t_2 :
  bd_shape_int64_t ->
  bd_shape_int64_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int64_t_2 :
  bd_shape_int64_t ->
  bd_shape_int64_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int64_t_2 :
  bd_shape_int64_t ->
  bd_shape_int64_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int64_t_2 :
  bd_shape_int64_t ->
  bd_shape_int64_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int64_t_2 :
  bd_shape_int64_t ->
  bd_shape_int64_t -> polyhedron * polyhedron
val ppl_new_BD_Shape_mpz_class_from_space_dimension :
  int -> degenerate_element -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int8_Box : int8_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int16_Box :
  int16_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int32_Box :
  int32_box -> bd_shape_mpz_class
```

```
val ppl_new_BD_Shape_mpz_class_from_Int64_Box :
  int64_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint8_Box :
  uint8_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint16_Box :
  uint16_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint32_Box :
  uint32_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint64_Box :
  uint64_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Z_Box : z_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Rational_Box :
  rational_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_C_Polyhedron :
  polyhedron -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_NNC_Polyhedron :
  polyhedron -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Grid : grid -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Float_Box :
  float_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_float :
  bd_shape_float -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_mpz_class
```

```
val ppl_new_BD_Shape_mpz_class_from_Double_Box :
  double_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_double :
  bd_shape_double -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Long_Double_Box :
  long_double_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_mpz_class
```

```
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_mpz_class
```

```
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_constraints :
  constraint_system -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_congruences :
  congruence_system -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_generators :
  generator_system -> bd_shape_mpz_class
val ppl_BD_Shape_mpz_class_swap :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_space_dimension : bd_shape_mpz_class -> int
val ppl_BD_Shape_mpz_class_affine_dimension : bd_shape_mpz_class -> int
val ppl_BD_Shape_mpz_class_relation_with_constraint :
  bd_shape_mpz_class ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_mpz_class_relation_with_generator :
  bd_shape_mpz_class ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_mpz_class_relation_with_congruence :
  bd_shape_mpz_class ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_mpz_class_get_constraints :
  bd_shape_mpz_class -> constraint_system
val ppl_BD_Shape_mpz_class_get_congruences :
  bd_shape_mpz_class -> congruence_system
val ppl_BD_Shape_mpz_class_get_minimized_constraints :
  bd_shape_mpz_class -> constraint_system
val ppl_BD_Shape_mpz_class_get_minimized_congruences :
  bd_shape_mpz_class -> congruence_system
val ppl_BD_Shape_mpz_class_is_empty : bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_is_universe : bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_is_bounded : bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_contains_integer_point :
  bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_is_topologically_closed :
  bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_is_discrete : bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_topological_closure_assign :
```

```
  bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_bounds_from_above :
  bd_shape_mpz_class -> linear_expression -> bool
val ppl_BD_Shape_mpz_class_bounds_from_below :
  bd_shape_mpz_class -> linear_expression -> bool
val ppl_BD_Shape_mpz_class_maximize :
  bd_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_mpz_class_minimize :
  bd_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_mpz_class_maximize_with_point :
  bd_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_mpz_class_minimize_with_point :
  bd_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_mpz_class_frequency :
  bd_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_mpz_class_contains_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_strictly_contains_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_is_disjoint_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_equals_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_OK : bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_add_constraint :
  bd_shape_mpz_class -> linear_constraint -> unit
val ppl_BD_Shape_mpz_class_add_congruence :
  bd_shape_mpz_class -> linear_congruence -> unit
val ppl_BD_Shape_mpz_class_add_constraints :
  bd_shape_mpz_class -> constraint_system -> unit
val ppl_BD_Shape_mpz_class_add_congruences :
  bd_shape_mpz_class -> congruence_system -> unit
val ppl_BD_Shape_mpz_class_refine_with_constraint :
  bd_shape_mpz_class -> linear_constraint -> unit
val ppl_BD_Shape_mpz_class_refine_with_congruence :
  bd_shape_mpz_class -> linear_congruence -> unit
val ppl_BD_Shape_mpz_class_refine_with_constraints :
  bd_shape_mpz_class -> constraint_system -> unit
val ppl_BD_Shape_mpz_class_refine_with_congruences :
  bd_shape_mpz_class -> congruence_system -> unit
val ppl_BD_Shape_mpz_class_intersection_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
```

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val ppl_BD_Shape_mpz_class_upper_bound_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_difference_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_concatenate_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_time_elapse_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_upper_bound_assign_if_exact :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_simplify_using_context_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_constrains : bd_shape_mpz_class -> int -> bool
val ppl_BD_Shape_mpz_class_unconstrain_space_dimension :
  bd_shape_mpz_class -> int -> unit
val ppl_BD_Shape_mpz_class_unconstrain_space_dimensions :
  bd_shape_mpz_class -> int list -> unit
val ppl_BD_Shape_mpz_class_affine_image :
  bd_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpz_class_affine_preimage :
  bd_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpz_class_bounded_affine_image :
  bd_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpz_class_bounded_affine_preimage :
  bd_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpz_class_generalized_affine_image :
  bd_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpz_class_generalized_affine_preimage :
  bd_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpz_class_generalized_affine_image_lhs_rhs :
  bd_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_mpz_class_generalized_affine_preimage_lhs_rhs :
  bd_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_mpz_class_add_space_dimensions_and_embed :
  bd_shape_mpz_class -> int -> unit
val ppl_BD_Shape_mpz_class_add_space_dimensions_and_project :
```

```
  bd_shape_mpz_class -> int -> unit
val ppl_BD_Shape_mpz_class_remove_space_dimensions :
  bd_shape_mpz_class -> int list -> unit
val ppl_BD_Shape_mpz_class_remove_higher_space_dimensions :
  bd_shape_mpz_class -> int -> unit
val ppl_BD_Shape_mpz_class_expand_space_dimension :
  bd_shape_mpz_class -> int -> int -> unit
val ppl_BD_Shape_mpz_class_fold_space_dimensions :
  bd_shape_mpz_class -> int list -> int -> unit
val ppl_BD_Shape_mpz_class_map_space_dimensions :
  bd_shape_mpz_class -> (int * int) list -> unit
val ppl_BD_Shape_mpz_class_drop_some_non_integer_points :
  bd_shape_mpz_class -> complexity_class -> unit
val ppl_BD_Shape_mpz_class_drop_some_non_integer_points_2 :
  bd_shape_mpz_class ->
  int list -> complexity_class -> unit
val ppl_BD_Shape_mpz_class_ascii_dump : bd_shape_mpz_class -> string
val ppl_BD_Shape_mpz_class_external_memory_in_bytes :
  bd_shape_mpz_class -> int
val ppl_BD_Shape_mpz_class_total_memory_in_bytes : bd_shape_mpz_class -> int
val ppl_BD_Shape_mpz_class_BHMZ05_widening_assign_with_tokens :
  bd_shape_mpz_class -> bd_shape_mpz_class -> int -> int
val ppl_BD_Shape_mpz_class_H79_widening_assign_with_tokens :
  bd_shape_mpz_class -> bd_shape_mpz_class -> int -> int
val ppl_BD_Shape_mpz_class_BHMZ05_widening_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_H79_widening_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_widening_assign_with_tokens :
  bd_shape_mpz_class -> bd_shape_mpz_class -> int -> int
val ppl_BD_Shape_mpz_class_widening_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> constraint_system -> int -> int
val ppl_BD_Shape_mpz_class_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> constraint_system -> int -> int
val ppl_BD_Shape_mpz_class_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> constraint_system -> int -> int
val ppl_BD_Shape_mpz_class_limited_BHMZ05_extrapolation_assign :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> constraint_system -> unit
val ppl_BD_Shape_mpz_class_limited_H79_extrapolation_assign :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> constraint_system -> unit
val ppl_BD_Shape_mpz_class_limited_CC76_extrapolation_assign :
  bd_shape_mpz_class ->
```

```
  bd_shape_mpz_class -> constraint_system -> unit
val ppl_BD_Shape_mpz_class_CC76_extrapolation_assign_with_tokens :
  bd_shape_mpz_class -> bd_shape_mpz_class -> int -> int
val ppl_BD_Shape_mpz_class_CC76_extrapolation_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_CC76_narrowing_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_linear_partition :
  bd_shape_mpz_class ->
  bd_shape_mpz_class ->
  bd_shape_mpz_class * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_mpz_class_wrap_assign :
  bd_shape_mpz_class ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_mpz_class : bd_shape_mpz_class -> bool
val ppl_termination_test_PR_BD_Shape_mpz_class : bd_shape_mpz_class -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_mpz_class :
  bd_shape_mpz_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_mpz_class :
  bd_shape_mpz_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_mpz_class :
  bd_shape_mpz_class -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_termination_test_PR_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> polyhedron * polyhedron
```

```
val ppl_new_BD_Shape_mpq_class_from_space_dimension :
  int -> degenerate_element -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int8_Box : int8_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int16_Box :
  int16_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int32_Box :
  int32_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int64_Box :
  int64_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint8_Box :
  uint8_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint16_Box :
  uint16_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint32_Box :
  uint32_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint64_Box :
  uint64_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Z_Box : z_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Rational_Box :
  rational_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_C_Polyhedron :
  polyhedron -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_NNC_Polyhedron :
  polyhedron -> bd_shape_mpq_class
```

```
val ppl_new_BD_Shape_mpq_class_from_Grid : grid -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Float_Box :
  float_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_float :
  bd_shape_float -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Double_Box :
  double_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_double :
  bd_shape_double -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Long_Double_Box :
  long_double_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int8_t_with_complexity :
```

```
  bd_shape_int8_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_float_with_complexity :
```

```
  octagonal_shape_float ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_constraints :
  constraint_system -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_congruences :
  congruence_system -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_generators :
  generator_system -> bd_shape_mpq_class
val ppl_BD_Shape_mpq_class_swap :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_space_dimension : bd_shape_mpq_class -> int
val ppl_BD_Shape_mpq_class_affine_dimension : bd_shape_mpq_class -> int
val ppl_BD_Shape_mpq_class_relation_with_constraint :
  bd_shape_mpq_class ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_mpq_class_relation_with_generator :
  bd_shape_mpq_class ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_mpq_class_relation_with_congruence :
  bd_shape_mpq_class ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_mpq_class_get_constraints :
  bd_shape_mpq_class -> constraint_system
val ppl_BD_Shape_mpq_class_get_congruences :
  bd_shape_mpq_class -> congruence_system
val ppl_BD_Shape_mpq_class_get_minimized_constraints :
  bd_shape_mpq_class -> constraint_system
val ppl_BD_Shape_mpq_class_get_minimized_congruences :
  bd_shape_mpq_class -> congruence_system
val ppl_BD_Shape_mpq_class_is_empty : bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_is_universe : bd_shape_mpq_class -> bool
```

```
val ppl_BD_Shape_mpq_class_is_bounded : bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_contains_integer_point :
  bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_is_topologically_closed :
  bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_is_discrete : bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_topological_closure_assign :
  bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_bounds_from_above :
  bd_shape_mpq_class -> linear_expression -> bool
val ppl_BD_Shape_mpq_class_bounds_from_below :
  bd_shape_mpq_class -> linear_expression -> bool
val ppl_BD_Shape_mpq_class_maximize :
  bd_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_mpq_class_minimize :
  bd_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_mpq_class_maximize_with_point :
  bd_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_mpq_class_minimize_with_point :
  bd_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_mpq_class_frequency :
  bd_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_mpq_class_contains_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_strictly_contains_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_is_disjoint_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_equals_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_OK : bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_add_constraint :
  bd_shape_mpq_class -> linear_constraint -> unit
val ppl_BD_Shape_mpq_class_add_congruence :
  bd_shape_mpq_class -> linear_congruence -> unit
val ppl_BD_Shape_mpq_class_add_constraints :
  bd_shape_mpq_class -> constraint_system -> unit
val ppl_BD_Shape_mpq_class_add_congruences :
  bd_shape_mpq_class -> congruence_system -> unit
val ppl_BD_Shape_mpq_class_refine_with_constraint :
  bd_shape_mpq_class -> linear_constraint -> unit
val ppl_BD_Shape_mpq_class_refine_with_congruence :
```

```
  bd_shape_mpq_class -> linear_congruence -> unit
val ppl_BD_Shape_mpq_class_refine_with_constraints :
  bd_shape_mpq_class -> constraint_system -> unit
val ppl_BD_Shape_mpq_class_refine_with_congruences :
  bd_shape_mpq_class -> congruence_system -> unit
val ppl_BD_Shape_mpq_class_intersection_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_upper_bound_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_difference_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_concatenate_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_time_elapse_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_upper_bound_assign_if_exact :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_simplify_using_context_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_constrains : bd_shape_mpq_class -> int -> bool
val ppl_BD_Shape_mpq_class_unconstrain_space_dimension :
  bd_shape_mpq_class -> int -> unit
val ppl_BD_Shape_mpq_class_unconstrain_space_dimensions :
  bd_shape_mpq_class -> int list -> unit
val ppl_BD_Shape_mpq_class_affine_image :
  bd_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpq_class_affine_preimage :
  bd_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpq_class_bounded_affine_image :
  bd_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpq_class_bounded_affine_preimage :
  bd_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpq_class_generalized_affine_image :
  bd_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpq_class_generalized_affine_preimage :
  bd_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpq_class_generalized_affine_image_lhs_rhs :
  bd_shape_mpq_class ->
  linear_expression ->
```

```
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_mpq_class_generalized_affine_preimage_lhs_rhs :
  bd_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_mpq_class_add_space_dimensions_and_embed :
  bd_shape_mpq_class -> int -> unit
val ppl_BD_Shape_mpq_class_add_space_dimensions_and_project :
  bd_shape_mpq_class -> int -> unit
val ppl_BD_Shape_mpq_class_remove_space_dimensions :
  bd_shape_mpq_class -> int list -> unit
val ppl_BD_Shape_mpq_class_remove_higher_space_dimensions :
  bd_shape_mpq_class -> int -> unit
val ppl_BD_Shape_mpq_class_expand_space_dimension :
  bd_shape_mpq_class -> int -> int -> unit
val ppl_BD_Shape_mpq_class_fold_space_dimensions :
  bd_shape_mpq_class -> int list -> int -> unit
val ppl_BD_Shape_mpq_class_map_space_dimensions :
  bd_shape_mpq_class -> (int * int) list -> unit
val ppl_BD_Shape_mpq_class_drop_some_non_integer_points :
  bd_shape_mpq_class -> complexity_class -> unit
val ppl_BD_Shape_mpq_class_drop_some_non_integer_points_2 :
  bd_shape_mpq_class ->
  int list -> complexity_class -> unit
val ppl_BD_Shape_mpq_class_ascii_dump : bd_shape_mpq_class -> string
val ppl_BD_Shape_mpq_class_external_memory_in_bytes :
  bd_shape_mpq_class -> int
val ppl_BD_Shape_mpq_class_total_memory_in_bytes : bd_shape_mpq_class -> int
val ppl_BD_Shape_mpq_class_BHMZ05_widening_assign_with_tokens :
  bd_shape_mpq_class -> bd_shape_mpq_class -> int -> int
val ppl_BD_Shape_mpq_class_H79_widening_assign_with_tokens :
  bd_shape_mpq_class -> bd_shape_mpq_class -> int -> int
val ppl_BD_Shape_mpq_class_BHMZ05_widening_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_H79_widening_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_widening_assign_with_tokens :
  bd_shape_mpq_class -> bd_shape_mpq_class -> int -> int
val ppl_BD_Shape_mpq_class_widening_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> constraint_system -> int -> int
val ppl_BD_Shape_mpq_class_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> constraint_system -> int -> int
val ppl_BD_Shape_mpq_class_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> constraint_system -> int -> int
```

```
val ppl_BD_Shape_mpq_class_limited_BHMZ05_extrapolation_assign :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> constraint_system -> unit
val ppl_BD_Shape_mpq_class_limited_H79_extrapolation_assign :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> constraint_system -> unit
val ppl_BD_Shape_mpq_class_limited_CC76_extrapolation_assign :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> constraint_system -> unit
val ppl_BD_Shape_mpq_class_CC76_extrapolation_assign_with_tokens :
  bd_shape_mpq_class -> bd_shape_mpq_class -> int -> int
val ppl_BD_Shape_mpq_class_CC76_extrapolation_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_CC76_narrowing_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_linear_partition :
  bd_shape_mpq_class ->
  bd_shape_mpq_class ->
  bd_shape_mpq_class * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_mpq_class_wrap_assign :
  bd_shape_mpq_class ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_mpq_class : bd_shape_mpq_class -> bool
val ppl_termination_test_PR_BD_Shape_mpq_class : bd_shape_mpq_class -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_mpq_class :
  bd_shape_mpq_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_mpq_class :
  bd_shape_mpq_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_mpq_class :
  bd_shape_mpq_class -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_mpq_class_2 :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_termination_test_PR_BD_Shape_mpq_class_2 :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_mpq_class_2 :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_mpq_class_2 :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_mpq_class_2 :
```

```
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_mpq_class_2 :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_mpq_class_2 :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> polyhedron * polyhedron
val ppl_new_Octagonal_Shape_int8_t_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int8_Box :
  int8_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int16_Box :
  int16_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int32_Box :
  int32_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int64_Box :
  int64_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint8_Box :
  uint8_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint16_Box :
  uint16_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint32_Box :
  uint32_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint64_Box :
  uint64_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Z_Box :
  z_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Rational_Box :
  rational_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_int8_t
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val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_C_Polyhedron :
  polyhedron -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Grid : grid -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Float_Box :
  float_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Double_Box :
  double_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Long_Double_Box :
  long_double_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint32_Box_with_complexity :
  uint32_box ->
```

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  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_NNC_Polyhedron_with_complexity :
```

```
  polyhedron ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_constraints :
  constraint_system -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_congruences :
  congruence_system -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_generators :
  generator_system -> octagonal_shape_int8_t
val ppl_Octagonal_Shape_int8_t_swap :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_space_dimension :
  octagonal_shape_int8_t -> int
val ppl_Octagonal_Shape_int8_t_affine_dimension :
  octagonal_shape_int8_t -> int
val ppl_Octagonal_Shape_int8_t_relation_with_constraint :
  octagonal_shape_int8_t ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_int8_t_relation_with_generator :
  octagonal_shape_int8_t ->
  linear_generator -> poly_gen_relation list
```

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val ppl_Octagonal_Shape_int8_t_relation_with_congruence :
  octagonal_shape_int8_t ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_int8_t_get_constraints :
  octagonal_shape_int8_t -> constraint_system
val ppl_Octagonal_Shape_int8_t_get_congruences :
  octagonal_shape_int8_t -> congruence_system
val ppl_Octagonal_Shape_int8_t_get_minimized_constraints :
  octagonal_shape_int8_t -> constraint_system
val ppl_Octagonal_Shape_int8_t_get_minimized_congruences :
  octagonal_shape_int8_t -> congruence_system
val ppl_Octagonal_Shape_int8_t_is_empty : octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_is_universe : octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_is_bounded : octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_contains_integer_point :
  octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_is_topologically_closed :
  octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_is_discrete : octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_topological_closure_assign :
  octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_bounds_from_above :
  octagonal_shape_int8_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int8_t_bounds_from_below :
  octagonal_shape_int8_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int8_t_maximize :
  octagonal_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int8_t_minimize :
  octagonal_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int8_t_maximize_with_point :
  octagonal_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int8_t_minimize_with_point :
  octagonal_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int8_t_frequency :
  octagonal_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_int8_t_contains_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_strictly_contains_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_is_disjoint_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_equals_Octagonal_Shape_int8_t :
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  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_OK : octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_add_constraint :
  octagonal_shape_int8_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int8_t_add_congruence :
  octagonal_shape_int8_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int8_t_add_constraints :
  octagonal_shape_int8_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int8_t_add_congruences :
  octagonal_shape_int8_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int8_t_refine_with_constraint :
  octagonal_shape_int8_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int8_t_refine_with_congruence :
  octagonal_shape_int8_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int8_t_refine_with_constraints :
  octagonal_shape_int8_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int8_t_refine_with_congruences :
  octagonal_shape_int8_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int8_t_intersection_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_upper_bound_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_difference_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_concatenate_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_time_elapse_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_upper_bound_assign_if_exact :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_simplify_using_context_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_constrains :
  octagonal_shape_int8_t -> int -> bool
val ppl_Octagonal_Shape_int8_t_unconstrain_space_dimension :
  octagonal_shape_int8_t -> int -> unit
val ppl_Octagonal_Shape_int8_t_unconstrain_space_dimensions :
  octagonal_shape_int8_t -> int list -> unit
val ppl_Octagonal_Shape_int8_t_affine_image :
  octagonal_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int8_t_affine_preimage :
  octagonal_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int8_t_bounded_affine_image :
  octagonal_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Octagonal_Shape_int8_t_bounded_affine_preimage :
  octagonal_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int8_t_generalized_affine_image :
  octagonal_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int8_t_generalized_affine_preimage :
  octagonal_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int8_t_generalized_affine_image_lhs_rhs :
  octagonal_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int8_t_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int8_t_add_space_dimensions_and_embed :
  octagonal_shape_int8_t -> int -> unit
val ppl_Octagonal_Shape_int8_t_add_space_dimensions_and_project :
  octagonal_shape_int8_t -> int -> unit
val ppl_Octagonal_Shape_int8_t_remove_space_dimensions :
  octagonal_shape_int8_t -> int list -> unit
val ppl_Octagonal_Shape_int8_t_remove_higher_space_dimensions :
  octagonal_shape_int8_t -> int -> unit
val ppl_Octagonal_Shape_int8_t_expand_space_dimension :
  octagonal_shape_int8_t -> int -> int -> unit
val ppl_Octagonal_Shape_int8_t_fold_space_dimensions :
  octagonal_shape_int8_t -> int list -> int -> unit
val ppl_Octagonal_Shape_int8_t_map_space_dimensions :
  octagonal_shape_int8_t -> (int * int) list -> unit
val ppl_Octagonal_Shape_int8_t_drop_some_non_integer_points :
  octagonal_shape_int8_t -> complexity_class -> unit
val ppl_Octagonal_Shape_int8_t_drop_some_non_integer_points_2 :
  octagonal_shape_int8_t ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_int8_t_ascii_dump : octagonal_shape_int8_t -> string
val ppl_Octagonal_Shape_int8_t_external_memory_in_bytes :
  octagonal_shape_int8_t -> int
val ppl_Octagonal_Shape_int8_t_total_memory_in_bytes :
  octagonal_shape_int8_t -> int
val ppl_Octagonal_Shape_int8_t_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> int -> int
val ppl_Octagonal_Shape_int8_t_BHMZ05_widening_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
```

```
val ppl_Octagonal_Shape_int8_t_widening_assign_with_tokens :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> int -> int
val ppl_Octagonal_Shape_int8_t_widening_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> constraint_system -> int -> int
val ppl_Octagonal_Shape_int8_t_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> constraint_system -> int -> int
val ppl_Octagonal_Shape_int8_t_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int8_t_limited_CC76_extrapolation_assign :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int8_t_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> int -> int
val ppl_Octagonal_Shape_int8_t_CC76_extrapolation_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_CC76_narrowing_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_linear_partition :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t * pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_int8_t_wrap_assign :
  octagonal_shape_int8_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t ->
  polyhedron * polyhedron
```

```
val ppl_termination_test_MS_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t ->
  polyhedron * polyhedron
val ppl_new_Octagonal_Shape_int16_t_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int8_Box :
  int8_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int16_Box :
  int16_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int32_Box :
  int32_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int64_Box :
  int64_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint8_Box :
  uint8_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint16_Box :
  uint16_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint32_Box :
  uint32_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint64_Box :
  uint64_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Z_Box :
  z_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Rational_Box :
  rational_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int64_t :
```

```
  bd_shape_int64_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_C_Polyhedron :
  polyhedron -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Grid :
  grid -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Float_Box :
  float_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Double_Box :
  double_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Long_Double_Box :
  long_double_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int32_Box_with_complexity :
```

```
  int32_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_int16_t
```

```
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_long_double_with_complexity
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_constraints :
  constraint_system -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_congruences :
  congruence_system -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_generators :
```

```
  generator_system -> octagonal_shape_int16_t
val ppl_Octagonal_Shape_int16_t_swap :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_space_dimension :
  octagonal_shape_int16_t -> int
val ppl_Octagonal_Shape_int16_t_affine_dimension :
  octagonal_shape_int16_t -> int
val ppl_Octagonal_Shape_int16_t_relation_with_constraint :
  octagonal_shape_int16_t ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_int16_t_relation_with_generator :
  octagonal_shape_int16_t ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_int16_t_relation_with_congruence :
  octagonal_shape_int16_t ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_int16_t_get_constraints :
  octagonal_shape_int16_t -> constraint_system
val ppl_Octagonal_Shape_int16_t_get_congruences :
  octagonal_shape_int16_t -> congruence_system
val ppl_Octagonal_Shape_int16_t_get_minimized_constraints :
  octagonal_shape_int16_t -> constraint_system
val ppl_Octagonal_Shape_int16_t_get_minimized_congruences :
  octagonal_shape_int16_t -> congruence_system
val ppl_Octagonal_Shape_int16_t_is_empty : octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_is_universe : octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_is_bounded : octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_contains_integer_point :
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_is_topologically_closed :
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_is_discrete : octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_topological_closure_assign :
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_bounds_from_above :
  octagonal_shape_int16_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int16_t_bounds_from_below :
  octagonal_shape_int16_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int16_t_maximize :
  octagonal_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int16_t_minimize :
  octagonal_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int16_t_maximize_with_point :
  octagonal_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
```

```
val ppl_Octagonal_Shape_int16_t_minimize_with_point :
  octagonal_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int16_t_frequency :
  octagonal_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_int16_t_contains_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_strictly_contains_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_is_disjoint_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_equals_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_OK : octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_add_constraint :
  octagonal_shape_int16_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int16_t_add_congruence :
  octagonal_shape_int16_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int16_t_add_constraints :
  octagonal_shape_int16_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int16_t_add_congruences :
  octagonal_shape_int16_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int16_t_refine_with_constraint :
  octagonal_shape_int16_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int16_t_refine_with_congruence :
  octagonal_shape_int16_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int16_t_refine_with_constraints :
  octagonal_shape_int16_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int16_t_refine_with_congruences :
  octagonal_shape_int16_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int16_t_intersection_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_upper_bound_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_difference_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_concatenate_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_time_elapse_assign :
```

```
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_upper_bound_assign_if_exact :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_simplify_using_context_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_constrains :
  octagonal_shape_int16_t -> int -> bool
val ppl_Octagonal_Shape_int16_t_unconstrain_space_dimension :
  octagonal_shape_int16_t -> int -> unit
val ppl_Octagonal_Shape_int16_t_unconstrain_space_dimensions :
  octagonal_shape_int16_t -> int list -> unit
val ppl_Octagonal_Shape_int16_t_affine_image :
  octagonal_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int16_t_affine_preimage :
  octagonal_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int16_t_bounded_affine_image :
  octagonal_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int16_t_bounded_affine_preimage :
  octagonal_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int16_t_generalized_affine_image :
  octagonal_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int16_t_generalized_affine_preimage :
  octagonal_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int16_t_generalized_affine_image_lhs_rhs :
  octagonal_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int16_t_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int16_t_add_space_dimensions_and_embed :
  octagonal_shape_int16_t -> int -> unit
val ppl_Octagonal_Shape_int16_t_add_space_dimensions_and_project :
  octagonal_shape_int16_t -> int -> unit
val ppl_Octagonal_Shape_int16_t_remove_space_dimensions :
  octagonal_shape_int16_t -> int list -> unit
```

```
val ppl_Octagonal_Shape_int16_t_remove_higher_space_dimensions :
  octagonal_shape_int16_t -> int -> unit
val ppl_Octagonal_Shape_int16_t_expand_space_dimension :
  octagonal_shape_int16_t -> int -> int -> unit
val ppl_Octagonal_Shape_int16_t_fold_space_dimensions :
  octagonal_shape_int16_t -> int list -> int -> unit
val ppl_Octagonal_Shape_int16_t_map_space_dimensions :
  octagonal_shape_int16_t -> (int * int) list -> unit
val ppl_Octagonal_Shape_int16_t_drop_some_non_integer_points :
  octagonal_shape_int16_t -> complexity_class -> unit
val ppl_Octagonal_Shape_int16_t_drop_some_non_integer_points_2 :
  octagonal_shape_int16_t ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_int16_t_ascii_dump :
  octagonal_shape_int16_t -> string
val ppl_Octagonal_Shape_int16_t_external_memory_in_bytes :
  octagonal_shape_int16_t -> int
val ppl_Octagonal_Shape_int16_t_total_memory_in_bytes :
  octagonal_shape_int16_t -> int
val ppl_Octagonal_Shape_int16_t_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> int -> int
val ppl_Octagonal_Shape_int16_t_BHMZ05_widening_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_widening_assign_with_tokens :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> int -> int
val ppl_Octagonal_Shape_int16_t_widening_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_int16_t_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_int16_t_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int16_t_limited_CC76_extrapolation_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int16_t_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> int -> int
val ppl_Octagonal_Shape_int16_t_CC76_extrapolation_assign :
  octagonal_shape_int16_t ->
```

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  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_CC76_narrowing_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_linear_partition :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t *
  pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_int16_t_wrap_assign :
  octagonal_shape_int16_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_int16_t_2 :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int16_t_2 :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int16_t_2 :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int16_t_2 :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int16_t_2 :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int16_t_2 :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int16_t_2 :
```

```
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t ->
  polyhedron * polyhedron
val ppl_new_Octagonal_Shape_int32_t_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int8_Box :
  int8_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int16_Box :
  int16_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int32_Box :
  int32_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int64_Box :
  int64_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint8_Box :
  uint8_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint16_Box :
  uint16_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint32_Box :
  uint32_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint64_Box :
  uint64_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Z_Box :
  z_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Rational_Box :
  rational_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_mpq_class :
```

```
  octagonal_shape_mpq_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_C_Polyhedron :
  polyhedron -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Grid :
  grid -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Float_Box :
  float_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Double_Box :
  double_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Long_Double_Box :
  long_double_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_int32_t
```

```
val ppl_new_Octagonal_Shape_int32_t_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Grid_with_complexity :
  grid ->
```

```
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_long_double_with_complexity
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_constraints :
  constraint_system -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_congruences :
  congruence_system -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_generators :
  generator_system -> octagonal_shape_int32_t
val ppl_Octagonal_Shape_int32_t_swap :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_space_dimension :
  octagonal_shape_int32_t -> int
val ppl_Octagonal_Shape_int32_t_affine_dimension :
  octagonal_shape_int32_t -> int
val ppl_Octagonal_Shape_int32_t_relation_with_constraint :
  octagonal_shape_int32_t ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_int32_t_relation_with_generator :
  octagonal_shape_int32_t ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_int32_t_relation_with_congruence :
  octagonal_shape_int32_t ->
  linear_congruence -> poly_con_relation list
```

```
val ppl_Octagonal_Shape_int32_t_get_constraints :
  octagonal_shape_int32_t -> constraint_system
val ppl_Octagonal_Shape_int32_t_get_congruences :
  octagonal_shape_int32_t -> congruence_system
val ppl_Octagonal_Shape_int32_t_get_minimized_constraints :
  octagonal_shape_int32_t -> constraint_system
val ppl_Octagonal_Shape_int32_t_get_minimized_congruences :
  octagonal_shape_int32_t -> congruence_system
val ppl_Octagonal_Shape_int32_t_is_empty : octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_is_universe : octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_is_bounded : octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_contains_integer_point :
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_is_topologically_closed :
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_is_discrete : octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_topological_closure_assign :
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_bounds_from_above :
  octagonal_shape_int32_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int32_t_bounds_from_below :
  octagonal_shape_int32_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int32_t_maximize :
  octagonal_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int32_t_minimize :
  octagonal_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int32_t_maximize_with_point :
  octagonal_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int32_t_minimize_with_point :
  octagonal_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int32_t_frequency :
  octagonal_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_int32_t_contains_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_strictly_contains_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_is_disjoint_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_equals_Octagonal_Shape_int32_t :
```

```
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_OK : octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_add_constraint :
  octagonal_shape_int32_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int32_t_add_congruence :
  octagonal_shape_int32_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int32_t_add_constraints :
  octagonal_shape_int32_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int32_t_add_congruences :
  octagonal_shape_int32_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int32_t_refine_with_constraint :
  octagonal_shape_int32_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int32_t_refine_with_congruence :
  octagonal_shape_int32_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int32_t_refine_with_constraints :
  octagonal_shape_int32_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int32_t_refine_with_congruences :
  octagonal_shape_int32_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int32_t_intersection_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_upper_bound_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_difference_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_concatenate_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_time_elapse_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_upper_bound_assign_if_exact :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_simplify_using_context_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_constrains :
  octagonal_shape_int32_t -> int -> bool
val ppl_Octagonal_Shape_int32_t_unconstrain_space_dimension :
  octagonal_shape_int32_t -> int -> unit
val ppl_Octagonal_Shape_int32_t_unconstrain_space_dimensions :
  octagonal_shape_int32_t -> int list -> unit
val ppl_Octagonal_Shape_int32_t_affine_image :
  octagonal_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Octagonal_Shape_int32_t_affine_preimage :
  octagonal_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int32_t_bounded_affine_image :
  octagonal_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int32_t_bounded_affine_preimage :
  octagonal_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int32_t_generalized_affine_image :
  octagonal_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int32_t_generalized_affine_preimage :
  octagonal_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int32_t_generalized_affine_image_lhs_rhs :
  octagonal_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int32_t_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int32_t_add_space_dimensions_and_embed :
  octagonal_shape_int32_t -> int -> unit
val ppl_Octagonal_Shape_int32_t_add_space_dimensions_and_project :
  octagonal_shape_int32_t -> int -> unit
val ppl_Octagonal_Shape_int32_t_remove_space_dimensions :
  octagonal_shape_int32_t -> int list -> unit
val ppl_Octagonal_Shape_int32_t_remove_higher_space_dimensions :
  octagonal_shape_int32_t -> int -> unit
val ppl_Octagonal_Shape_int32_t_expand_space_dimension :
  octagonal_shape_int32_t -> int -> int -> unit
val ppl_Octagonal_Shape_int32_t_fold_space_dimensions :
  octagonal_shape_int32_t -> int list -> int -> unit
val ppl_Octagonal_Shape_int32_t_map_space_dimensions :
  octagonal_shape_int32_t -> (int * int) list -> unit
val ppl_Octagonal_Shape_int32_t_drop_some_non_integer_points :
  octagonal_shape_int32_t -> complexity_class -> unit
val ppl_Octagonal_Shape_int32_t_drop_some_non_integer_points_2 :
  octagonal_shape_int32_t ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_int32_t_ascii_dump :
  octagonal_shape_int32_t -> string
val ppl_Octagonal_Shape_int32_t_external_memory_in_bytes :
  octagonal_shape_int32_t -> int
```

```
val ppl_Octagonal_Shape_int32_t_total_memory_in_bytes :
  octagonal_shape_int32_t -> int
val ppl_Octagonal_Shape_int32_t_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> int -> int
val ppl_Octagonal_Shape_int32_t_BHMZ05_widening_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_widening_assign_with_tokens :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> int -> int
val ppl_Octagonal_Shape_int32_t_widening_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_int32_t_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_int32_t_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int32_t_limited_CC76_extrapolation_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int32_t_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> int -> int
val ppl_Octagonal_Shape_int32_t_CC76_extrapolation_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_CC76_narrowing_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_linear_partition :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t *
  pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_int32_t_wrap_assign :
  octagonal_shape_int32_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bool
```

```
val ppl_termination_test_PR_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t ->
  polyhedron * polyhedron
val ppl_new_Octagonal_Shape_int64_t_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int8_Box :
  int8_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int16_Box :
  int16_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int32_Box :
  int32_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int64_Box :
  int64_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint8_Box :
  uint8_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint16_Box :
  uint16_box -> octagonal_shape_int64_t
```

```
val ppl_new_Octagonal_Shape_int64_t_from_Uint32_Box :
  uint32_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint64_Box :
  uint64_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Z_Box :
  z_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Rational_Box :
  rational_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_C_Polyhedron :
  polyhedron -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Grid :
  grid -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Float_Box :
  float_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Double_Box :
  double_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_int64_t
```

```
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Long_Double_Box :
  long_double_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_int64_t
```

```
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
```

```
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_long_double_with_complexity
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_constraints :
  constraint_system -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_congruences :
  congruence_system -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_generators :
  generator_system -> octagonal_shape_int64_t
val ppl_Octagonal_Shape_int64_t_swap :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_space_dimension :
  octagonal_shape_int64_t -> int
val ppl_Octagonal_Shape_int64_t_affine_dimension :
  octagonal_shape_int64_t -> int
val ppl_Octagonal_Shape_int64_t_relation_with_constraint :
  octagonal_shape_int64_t ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_int64_t_relation_with_generator :
  octagonal_shape_int64_t ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_int64_t_relation_with_congruence :
  octagonal_shape_int64_t ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_int64_t_get_constraints :
  octagonal_shape_int64_t -> constraint_system
val ppl_Octagonal_Shape_int64_t_get_congruences :
  octagonal_shape_int64_t -> congruence_system
val ppl_Octagonal_Shape_int64_t_get_minimized_constraints :
  octagonal_shape_int64_t -> constraint_system
val ppl_Octagonal_Shape_int64_t_get_minimized_congruences :
  octagonal_shape_int64_t -> congruence_system
val ppl_Octagonal_Shape_int64_t_is_empty : octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_is_universe : octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_is_bounded : octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_contains_integer_point :
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_is_topologically_closed :
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_is_discrete : octagonal_shape_int64_t -> bool
```

```
val ppl_Octagonal_Shape_int64_t_topological_closure_assign :
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_bounds_from_above :
  octagonal_shape_int64_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int64_t_bounds_from_below :
  octagonal_shape_int64_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int64_t_maximize :
  octagonal_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int64_t_minimize :
  octagonal_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int64_t_maximize_with_point :
  octagonal_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int64_t_minimize_with_point :
  octagonal_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int64_t_frequency :
  octagonal_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_int64_t_contains_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_strictly_contains_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_is_disjoint_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_equals_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_OK : octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_add_constraint :
  octagonal_shape_int64_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int64_t_add_congruence :
  octagonal_shape_int64_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int64_t_add_constraints :
  octagonal_shape_int64_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int64_t_add_congruences :
  octagonal_shape_int64_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int64_t_refine_with_constraint :
  octagonal_shape_int64_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int64_t_refine_with_congruence :
  octagonal_shape_int64_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int64_t_refine_with_constraints :
```

```
  octagonal_shape_int64_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int64_t_refine_with_congruences :
  octagonal_shape_int64_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int64_t_intersection_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_upper_bound_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_difference_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_concatenate_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_time_elapse_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_upper_bound_assign_if_exact :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_simplify_using_context_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_constrains :
  octagonal_shape_int64_t -> int -> bool
val ppl_Octagonal_Shape_int64_t_unconstrain_space_dimension :
  octagonal_shape_int64_t -> int -> unit
val ppl_Octagonal_Shape_int64_t_unconstrain_space_dimensions :
  octagonal_shape_int64_t -> int list -> unit
val ppl_Octagonal_Shape_int64_t_affine_image :
  octagonal_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int64_t_affine_preimage :
  octagonal_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int64_t_bounded_affine_image :
  octagonal_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int64_t_bounded_affine_preimage :
  octagonal_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int64_t_generalized_affine_image :
  octagonal_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int64_t_generalized_affine_preimage :
  octagonal_shape_int64_t ->
```

```
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int64_t_generalized_affine_image_lhs_rhs :
  octagonal_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int64_t_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int64_t_add_space_dimensions_and_embed :
  octagonal_shape_int64_t -> int -> unit
val ppl_Octagonal_Shape_int64_t_add_space_dimensions_and_project :
  octagonal_shape_int64_t -> int -> unit
val ppl_Octagonal_Shape_int64_t_remove_space_dimensions :
  octagonal_shape_int64_t -> int list -> unit
val ppl_Octagonal_Shape_int64_t_remove_higher_space_dimensions :
  octagonal_shape_int64_t -> int -> unit
val ppl_Octagonal_Shape_int64_t_expand_space_dimension :
  octagonal_shape_int64_t -> int -> int -> unit
val ppl_Octagonal_Shape_int64_t_fold_space_dimensions :
  octagonal_shape_int64_t -> int list -> int -> unit
val ppl_Octagonal_Shape_int64_t_map_space_dimensions :
  octagonal_shape_int64_t -> (int * int) list -> unit
val ppl_Octagonal_Shape_int64_t_drop_some_non_integer_points :
  octagonal_shape_int64_t -> complexity_class -> unit
val ppl_Octagonal_Shape_int64_t_drop_some_non_integer_points_2 :
  octagonal_shape_int64_t ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_int64_t_ascii_dump :
  octagonal_shape_int64_t -> string
val ppl_Octagonal_Shape_int64_t_external_memory_in_bytes :
  octagonal_shape_int64_t -> int
val ppl_Octagonal_Shape_int64_t_total_memory_in_bytes :
  octagonal_shape_int64_t -> int
val ppl_Octagonal_Shape_int64_t_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> int -> int
val ppl_Octagonal_Shape_int64_t_BHMZ05_widening_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_widening_assign_with_tokens :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> int -> int
val ppl_Octagonal_Shape_int64_t_widening_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_int64_t ->
```

```
  octagonal_shape_int64_t ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_int64_t_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_int64_t_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int64_t_limited_CC76_extrapolation_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int64_t_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> int -> int
val ppl_Octagonal_Shape_int64_t_CC76_extrapolation_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_CC76_narrowing_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_linear_partition :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t *
  pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_int64_t_wrap_assign :
  octagonal_shape_int64_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
```

```
  octagonal_shape_int64_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t ->
  polyhedron * polyhedron
val ppl_new_Octagonal_Shape_mpz_class_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int8_Box :
  int8_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int16_Box :
  int16_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int32_Box :
  int32_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int64_Box :
  int64_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint8_Box :
  uint8_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint16_Box :
  uint16_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint32_Box :
  uint32_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint64_Box :
  uint64_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Z_Box :
  z_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Rational_Box :
  rational_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int64_t :
```

```
  bd_shape_int64_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_C_Polyhedron :
  polyhedron -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Grid :
  grid -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Float_Box :
  float_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Double_Box :
  double_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Long_Double_Box :
  long_double_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int32_Box_with_complexity :
```

```
  int32_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_mpz_class
```

```
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class_with_complexity
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpq_class_with_complexity
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_long_double_with_complexit
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_constraints :
  constraint_system -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_congruences :
  congruence_system -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_generators :
```

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  generator_system -> octagonal_shape_mpz_class
val ppl_Octagonal_Shape_mpz_class_swap :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_space_dimension :
  octagonal_shape_mpz_class -> int
val ppl_Octagonal_Shape_mpz_class_affine_dimension :
  octagonal_shape_mpz_class -> int
val ppl_Octagonal_Shape_mpz_class_relation_with_constraint :
  octagonal_shape_mpz_class ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_mpz_class_relation_with_generator :
  octagonal_shape_mpz_class ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_mpz_class_relation_with_congruence :
  octagonal_shape_mpz_class ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_mpz_class_get_constraints :
  octagonal_shape_mpz_class -> constraint_system
val ppl_Octagonal_Shape_mpz_class_get_congruences :
  octagonal_shape_mpz_class -> congruence_system
val ppl_Octagonal_Shape_mpz_class_get_minimized_constraints :
  octagonal_shape_mpz_class -> constraint_system
val ppl_Octagonal_Shape_mpz_class_get_minimized_congruences :
  octagonal_shape_mpz_class -> congruence_system
val ppl_Octagonal_Shape_mpz_class_is_empty :
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_is_universe :
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_is_bounded :
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_contains_integer_point :
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_is_topologically_closed :
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_is_discrete :
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_topological_closure_assign :
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_bounds_from_above :
  octagonal_shape_mpz_class -> linear_expression -> bool
val ppl_Octagonal_Shape_mpz_class_bounds_from_below :
  octagonal_shape_mpz_class -> linear_expression -> bool
val ppl_Octagonal_Shape_mpz_class_maximize :
  octagonal_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_mpz_class_minimize :
  octagonal_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
```

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val ppl_Octagonal_Shape_mpz_class_maximize_with_point :
  octagonal_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_mpz_class_minimize_with_point :
  octagonal_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_mpz_class_frequency :
  octagonal_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_mpz_class_contains_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_strictly_contains_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_is_disjoint_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_equals_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_OK : octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_add_constraint :
  octagonal_shape_mpz_class -> linear_constraint -> unit
val ppl_Octagonal_Shape_mpz_class_add_congruence :
  octagonal_shape_mpz_class -> linear_congruence -> unit
val ppl_Octagonal_Shape_mpz_class_add_constraints :
  octagonal_shape_mpz_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpz_class_add_congruences :
  octagonal_shape_mpz_class -> congruence_system -> unit
val ppl_Octagonal_Shape_mpz_class_refine_with_constraint :
  octagonal_shape_mpz_class -> linear_constraint -> unit
val ppl_Octagonal_Shape_mpz_class_refine_with_congruence :
  octagonal_shape_mpz_class -> linear_congruence -> unit
val ppl_Octagonal_Shape_mpz_class_refine_with_constraints :
  octagonal_shape_mpz_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpz_class_refine_with_congruences :
  octagonal_shape_mpz_class -> congruence_system -> unit
val ppl_Octagonal_Shape_mpz_class_intersection_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_upper_bound_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_difference_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
```

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val ppl_Octagonal_Shape_mpz_class_concatenate_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_time_elapse_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_upper_bound_assign_if_exact :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_simplify_using_context_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_constrains :
  octagonal_shape_mpz_class -> int -> bool
val ppl_Octagonal_Shape_mpz_class_unconstrain_space_dimension :
  octagonal_shape_mpz_class -> int -> unit
val ppl_Octagonal_Shape_mpz_class_unconstrain_space_dimensions :
  octagonal_shape_mpz_class -> int list -> unit
val ppl_Octagonal_Shape_mpz_class_affine_image :
  octagonal_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpz_class_affine_preimage :
  octagonal_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpz_class_bounded_affine_image :
  octagonal_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpz_class_bounded_affine_preimage :
  octagonal_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpz_class_generalized_affine_image :
  octagonal_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpz_class_generalized_affine_preimage :
  octagonal_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpz_class_generalized_affine_image_lhs_rhs :
  octagonal_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_mpz_class_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_mpz_class_add_space_dimensions_and_embed :
  octagonal_shape_mpz_class -> int -> unit
```

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val ppl_Octagonal_Shape_mpz_class_add_space_dimensions_and_project :
  octagonal_shape_mpz_class -> int -> unit
val ppl_Octagonal_Shape_mpz_class_remove_space_dimensions :
  octagonal_shape_mpz_class -> int list -> unit
val ppl_Octagonal_Shape_mpz_class_remove_higher_space_dimensions :
  octagonal_shape_mpz_class -> int -> unit
val ppl_Octagonal_Shape_mpz_class_expand_space_dimension :
  octagonal_shape_mpz_class -> int -> int -> unit
val ppl_Octagonal_Shape_mpz_class_fold_space_dimensions :
  octagonal_shape_mpz_class -> int list -> int -> unit
val ppl_Octagonal_Shape_mpz_class_map_space_dimensions :
  octagonal_shape_mpz_class -> (int * int) list -> unit
val ppl_Octagonal_Shape_mpz_class_drop_some_non_integer_points :
  octagonal_shape_mpz_class -> complexity_class -> unit
val ppl_Octagonal_Shape_mpz_class_drop_some_non_integer_points_2 :
  octagonal_shape_mpz_class ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_mpz_class_ascii_dump :
  octagonal_shape_mpz_class -> string
val ppl_Octagonal_Shape_mpz_class_external_memory_in_bytes :
  octagonal_shape_mpz_class -> int
val ppl_Octagonal_Shape_mpz_class_total_memory_in_bytes :
  octagonal_shape_mpz_class -> int
val ppl_Octagonal_Shape_mpz_class_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> int -> int
val ppl_Octagonal_Shape_mpz_class_BHMZ05_widening_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_widening_assign_with_tokens :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> int -> int
val ppl_Octagonal_Shape_mpz_class_widening_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_mpz_class_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_mpz_class_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpz_class_limited_CC76_extrapolation_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> constraint_system -> unit
```

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val ppl_Octagonal_Shape_mpz_class_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> int -> int
val ppl_Octagonal_Shape_mpz_class_CC76_extrapolation_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_CC76_narrowing_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_linear_partition :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class *
  pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_mpz_class_wrap_assign :
  octagonal_shape_mpz_class ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bool
val ppl_termination_test_PR_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_termination_test_PR_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
```

```
  octagonal_shape_mpz_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class ->
  polyhedron * polyhedron
val ppl_new_Octagonal_Shape_mpq_class_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int8_Box :
  int8_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int16_Box :
  int16_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int32_Box :
  int32_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int64_Box :
  int64_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint8_Box :
  uint8_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint16_Box :
  uint16_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint32_Box :
  uint32_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint64_Box :
  uint64_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Z_Box :
  z_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Rational_Box :
  rational_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_mpq_class
```

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val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_C_Polyhedron :
  polyhedron -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Grid :
  grid -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Float_Box :
  float_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Double_Box :
  double_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Long_Double_Box :
  long_double_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint32_Box_with_complexity :
```

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  uint32_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpz_class_with_complexity
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpq_class_with_complexity
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_mpq_class
```

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val ppl_new_Octagonal_Shape_mpq_class_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_long_double_with_complexit
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_constraints :
  constraint_system -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_congruences :
  congruence_system -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_generators :
  generator_system -> octagonal_shape_mpq_class
val ppl_Octagonal_Shape_mpq_class_swap :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_space_dimension :
  octagonal_shape_mpq_class -> int
val ppl_Octagonal_Shape_mpq_class_affine_dimension :
  octagonal_shape_mpq_class -> int
val ppl_Octagonal_Shape_mpq_class_relation_with_constraint :
  octagonal_shape_mpq_class ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_mpq_class_relation_with_generator :
```

```
  octagonal_shape_mpq_class ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_mpq_class_relation_with_congruence :
  octagonal_shape_mpq_class ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_mpq_class_get_constraints :
  octagonal_shape_mpq_class -> constraint_system
val ppl_Octagonal_Shape_mpq_class_get_congruences :
  octagonal_shape_mpq_class -> congruence_system
val ppl_Octagonal_Shape_mpq_class_get_minimized_constraints :
  octagonal_shape_mpq_class -> constraint_system
val ppl_Octagonal_Shape_mpq_class_get_minimized_congruences :
  octagonal_shape_mpq_class -> congruence_system
val ppl_Octagonal_Shape_mpq_class_is_empty :
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_is_universe :
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_is_bounded :
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_contains_integer_point :
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_is_topologically_closed :
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_is_discrete :
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_topological_closure_assign :
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_bounds_from_above :
  octagonal_shape_mpq_class -> linear_expression -> bool
val ppl_Octagonal_Shape_mpq_class_bounds_from_below :
  octagonal_shape_mpq_class -> linear_expression -> bool
val ppl_Octagonal_Shape_mpq_class_maximize :
  octagonal_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_mpq_class_minimize :
  octagonal_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_mpq_class_maximize_with_point :
  octagonal_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_mpq_class_minimize_with_point :
  octagonal_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_mpq_class_frequency :
  octagonal_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_mpq_class_contains_Octagonal_Shape_mpq_class :
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  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_strictly_contains_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_is_disjoint_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_equals_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_OK : octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_add_constraint :
  octagonal_shape_mpq_class -> linear_constraint -> unit
val ppl_Octagonal_Shape_mpq_class_add_congruence :
  octagonal_shape_mpq_class -> linear_congruence -> unit
val ppl_Octagonal_Shape_mpq_class_add_constraints :
  octagonal_shape_mpq_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpq_class_add_congruences :
  octagonal_shape_mpq_class -> congruence_system -> unit
val ppl_Octagonal_Shape_mpq_class_refine_with_constraint :
  octagonal_shape_mpq_class -> linear_constraint -> unit
val ppl_Octagonal_Shape_mpq_class_refine_with_congruence :
  octagonal_shape_mpq_class -> linear_congruence -> unit
val ppl_Octagonal_Shape_mpq_class_refine_with_constraints :
  octagonal_shape_mpq_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpq_class_refine_with_congruences :
  octagonal_shape_mpq_class -> congruence_system -> unit
val ppl_Octagonal_Shape_mpq_class_intersection_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_upper_bound_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_difference_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_concatenate_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_time_elapse_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_upper_bound_assign_if_exact :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_simplify_using_context_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
```

```
val ppl_Octagonal_Shape_mpq_class_constrains :
  octagonal_shape_mpq_class -> int -> bool
val ppl_Octagonal_Shape_mpq_class_unconstrain_space_dimension :
  octagonal_shape_mpq_class -> int -> unit
val ppl_Octagonal_Shape_mpq_class_unconstrain_space_dimensions :
  octagonal_shape_mpq_class -> int list -> unit
val ppl_Octagonal_Shape_mpq_class_affine_image :
  octagonal_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpq_class_affine_preimage :
  octagonal_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpq_class_bounded_affine_image :
  octagonal_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpq_class_bounded_affine_preimage :
  octagonal_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpq_class_generalized_affine_image :
  octagonal_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpq_class_generalized_affine_preimage :
  octagonal_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpq_class_generalized_affine_image_lhs_rhs :
  octagonal_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_mpq_class_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_mpq_class_add_space_dimensions_and_embed :
  octagonal_shape_mpq_class -> int -> unit
val ppl_Octagonal_Shape_mpq_class_add_space_dimensions_and_project :
  octagonal_shape_mpq_class -> int -> unit
val ppl_Octagonal_Shape_mpq_class_remove_space_dimensions :
  octagonal_shape_mpq_class -> int list -> unit
val ppl_Octagonal_Shape_mpq_class_remove_higher_space_dimensions :
  octagonal_shape_mpq_class -> int -> unit
val ppl_Octagonal_Shape_mpq_class_expand_space_dimension :
  octagonal_shape_mpq_class -> int -> int -> unit
val ppl_Octagonal_Shape_mpq_class_fold_space_dimensions :
  octagonal_shape_mpq_class -> int list -> int -> unit
val ppl_Octagonal_Shape_mpq_class_map_space_dimensions :
  octagonal_shape_mpq_class -> (int * int) list -> unit
```

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val ppl_Octagonal_Shape_mpq_class_drop_some_non_integer_points :
  octagonal_shape_mpq_class -> complexity_class -> unit
val ppl_Octagonal_Shape_mpq_class_drop_some_non_integer_points_2 :
  octagonal_shape_mpq_class ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_mpq_class_ascii_dump :
  octagonal_shape_mpq_class -> string
val ppl_Octagonal_Shape_mpq_class_external_memory_in_bytes :
  octagonal_shape_mpq_class -> int
val ppl_Octagonal_Shape_mpq_class_total_memory_in_bytes :
  octagonal_shape_mpq_class -> int
val ppl_Octagonal_Shape_mpq_class_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> int -> int
val ppl_Octagonal_Shape_mpq_class_BHMZ05_widening_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_widening_assign_with_tokens :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> int -> int
val ppl_Octagonal_Shape_mpq_class_widening_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_mpq_class_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_mpq_class_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpq_class_limited_CC76_extrapolation_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpq_class_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> int -> int
val ppl_Octagonal_Shape_mpq_class_CC76_extrapolation_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_CC76_narrowing_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_linear_partition :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class *
```

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  pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_mpq_class_wrap_assign :
  octagonal_shape_mpq_class ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bool
val ppl_termination_test_PR_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_termination_test_PR_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class ->
  polyhedron * polyhedron
val ppl_new_C_Polyhedron_from_space_dimension :
  int -> degenerate_element -> polyhedron
val ppl_new_NNC_Polyhedron_from_space_dimension :
  int -> degenerate_element -> polyhedron
val ppl_new_C_Polyhedron_from_Int8_Box : int8_box -> polyhedron
```

```
val ppl_new_NNC_Polyhedron_from_Int8_Box : int8_box -> polyhedron
val ppl_new_C_Polyhedron_from_Int16_Box : int16_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int16_Box : int16_box -> polyhedron
val ppl_new_C_Polyhedron_from_Int32_Box : int32_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int32_Box : int32_box -> polyhedron
val ppl_new_C_Polyhedron_from_Int64_Box : int64_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int64_Box : int64_box -> polyhedron
val ppl_new_C_Polyhedron_from_Uint8_Box : uint8_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint8_Box : uint8_box -> polyhedron
val ppl_new_C_Polyhedron_from_Uint16_Box : uint16_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint16_Box : uint16_box -> polyhedron
val ppl_new_C_Polyhedron_from_Uint32_Box : uint32_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint32_Box : uint32_box -> polyhedron
val ppl_new_C_Polyhedron_from_Uint64_Box : uint64_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint64_Box : uint64_box -> polyhedron
val ppl_new_C_Polyhedron_from_Z_Box : z_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Z_Box : z_box -> polyhedron
val ppl_new_C_Polyhedron_from_Rational_Box : rational_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Rational_Box : rational_box -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int8_t : bd_shape_int8_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int8_t :
  bd_shape_int8_t -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int16_t :
  bd_shape_int16_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int16_t :
  bd_shape_int16_t -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int32_t :
  bd_shape_int32_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int32_t :
  bd_shape_int32_t -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int64_t :
  bd_shape_int64_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int64_t :
  bd_shape_int64_t -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> polyhedron
```

```
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> polyhedron
val ppl_new_C_Polyhedron_from_C_Polyhedron : polyhedron -> polyhedron
val ppl_new_NNC_Polyhedron_from_C_Polyhedron : polyhedron -> polyhedron
val ppl_new_C_Polyhedron_from_NNC_Polyhedron : polyhedron -> polyhedron
val ppl_new_NNC_Polyhedron_from_NNC_Polyhedron : polyhedron -> polyhedron
val ppl_new_C_Polyhedron_from_Grid : grid -> polyhedron
val ppl_new_NNC_Polyhedron_from_Grid : grid -> polyhedron
val ppl_new_C_Polyhedron_from_Float_Box : float_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Float_Box : float_box -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_float : bd_shape_float -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_float : bd_shape_float -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_float :
  octagonal_shape_float -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_float :
  octagonal_shape_float -> polyhedron
val ppl_new_C_Polyhedron_from_Double_Box : double_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Double_Box : double_box -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_double : bd_shape_double -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_double :
  bd_shape_double -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_double :
  octagonal_shape_double -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_double :
  octagonal_shape_double -> polyhedron
val ppl_new_C_Polyhedron_from_Long_Double_Box : long_double_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Long_Double_Box :
  long_double_box -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_long_double :
```

```
  bd_shape_long_double -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_long_double :
  bd_shape_long_double -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> polyhedron
val ppl_new_C_Polyhedron_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Z_Box_with_complexity :
  z_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Z_Box_with_complexity :
  z_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int8_t_with_complexity :
```

```
  bd_shape_int8_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> polyhedron
```

```
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Grid_with_complexity :
  grid -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Grid_with_complexity :
  grid -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Float_Box_with_complexity :
  float_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Float_Box_with_complexity :
  float_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> polyhedron
```

```
val ppl_new_C_Polyhedron_from_Double_Box_with_complexity :
  double_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Double_Box_with_complexity :
  double_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_constraints : constraint_system -> polyhedron
val ppl_new_NNC_Polyhedron_from_constraints : constraint_system -> polyhedron
val ppl_new_C_Polyhedron_from_congruences : congruence_system -> polyhedron
val ppl_new_NNC_Polyhedron_from_congruences : congruence_system -> polyhedron
val ppl_new_C_Polyhedron_from_generators : generator_system -> polyhedron
val ppl_new_NNC_Polyhedron_from_generators : generator_system -> polyhedron
val ppl_Polyhedron_swap : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_space_dimension : polyhedron -> int
val ppl_Polyhedron_affine_dimension : polyhedron -> int
val ppl_Polyhedron_relation_with_constraint :
  polyhedron ->
  linear_constraint -> poly_con_relation list
val ppl_Polyhedron_relation_with_generator :
  polyhedron ->
  linear_generator -> poly_gen_relation list
```

```
val ppl_Polyhedron_relation_with_congruence :
  polyhedron ->
  linear_congruence -> poly_con_relation list
val ppl_Polyhedron_get_constraints : polyhedron -> constraint_system
val ppl_Polyhedron_get_congruences : polyhedron -> congruence_system
val ppl_Polyhedron_get_generators : polyhedron -> generator_system
val ppl_Polyhedron_get_minimized_constraints :
  polyhedron -> constraint_system
val ppl_Polyhedron_get_minimized_congruences :
  polyhedron -> congruence_system
val ppl_Polyhedron_get_minimized_generators : polyhedron -> generator_system
val ppl_Polyhedron_is_empty : polyhedron -> bool
val ppl_Polyhedron_is_universe : polyhedron -> bool
val ppl_Polyhedron_is_bounded : polyhedron -> bool
val ppl_Polyhedron_contains_integer_point : polyhedron -> bool
val ppl_Polyhedron_is_topologically_closed : polyhedron -> bool
val ppl_Polyhedron_is_discrete : polyhedron -> bool
val ppl_Polyhedron_topological_closure_assign : polyhedron -> unit
val ppl_Polyhedron_bounds_from_above :
  polyhedron -> linear_expression -> bool
val ppl_Polyhedron_bounds_from_below :
  polyhedron -> linear_expression -> bool
val ppl_Polyhedron_maximize :
  polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Polyhedron_minimize :
  polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Polyhedron_maximize_with_point :
  polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Polyhedron_minimize_with_point :
  polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Polyhedron_frequency :
  polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Polyhedron_contains_Polyhedron : polyhedron -> polyhedron -> bool
val ppl_Polyhedron_strictly_contains_Polyhedron :
  polyhedron -> polyhedron -> bool
val ppl_Polyhedron_is_disjoint_from_Polyhedron :
  polyhedron -> polyhedron -> bool
val ppl_Polyhedron_equals_Polyhedron : polyhedron -> polyhedron -> bool
val ppl_Polyhedron_OK : polyhedron -> bool
val ppl_Polyhedron_add_constraint : polyhedron -> linear_constraint -> unit
```

```
val ppl_Polyhedron_add_congruence : polyhedron -> linear_congruence -> unit
val ppl_Polyhedron_add_generator : polyhedron -> linear_generator -> unit
val ppl_Polyhedron_add_constraints : polyhedron -> constraint_system -> unit
val ppl_Polyhedron_add_congruences : polyhedron -> congruence_system -> unit
val ppl_Polyhedron_add_generators : polyhedron -> generator_system -> unit
val ppl_Polyhedron_refine_with_constraint :
  polyhedron -> linear_constraint -> unit
val ppl_Polyhedron_refine_with_congruence :
  polyhedron -> linear_congruence -> unit
val ppl_Polyhedron_refine_with_constraints :
  polyhedron -> constraint_system -> unit
val ppl_Polyhedron_refine_with_congruences :
  polyhedron -> congruence_system -> unit
val ppl_Polyhedron_intersection_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_upper_bound_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_difference_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_concatenate_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_time_elapse_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_poly_hull_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_poly_difference_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_upper_bound_assign_if_exact :
  polyhedron -> polyhedron -> bool
val ppl_Polyhedron_poly_hull_assign_if_exact :
  polyhedron -> polyhedron -> bool
val ppl_Polyhedron_simplify_using_context_assign :
  polyhedron -> polyhedron -> bool
val ppl_Polyhedron_constrains : polyhedron -> int -> bool
val ppl_Polyhedron_unconstrain_space_dimension : polyhedron -> int -> unit
val ppl_Polyhedron_unconstrain_space_dimensions :
  polyhedron -> int list -> unit
val ppl_Polyhedron_affine_image :
  polyhedron -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Polyhedron_affine_preimage :
  polyhedron -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Polyhedron_bounded_affine_image :
  polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Polyhedron_bounded_affine_preimage :
  polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Polyhedron_generalized_affine_image :
  polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Polyhedron_generalized_affine_preimage :
```

```
  polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Polyhedron_generalized_affine_image_lhs_rhs :
  polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Polyhedron_generalized_affine_preimage_lhs_rhs :
  polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Polyhedron_add_space_dimensions_and_embed : polyhedron -> int -> unit
val ppl_Polyhedron_add_space_dimensions_and_project :
  polyhedron -> int -> unit
val ppl_Polyhedron_remove_space_dimensions : polyhedron -> int list -> unit
val ppl_Polyhedron_remove_higher_space_dimensions : polyhedron -> int -> unit
val ppl_Polyhedron_expand_space_dimension : polyhedron -> int -> int -> unit
val ppl_Polyhedron_fold_space_dimensions :
  polyhedron -> int list -> int -> unit
val ppl_Polyhedron_map_space_dimensions :
  polyhedron -> (int * int) list -> unit
val ppl_Polyhedron_drop_some_non_integer_points :
  polyhedron -> complexity_class -> unit
val ppl_Polyhedron_drop_some_non_integer_points_2 :
  polyhedron -> int list -> complexity_class -> unit
val ppl_Polyhedron_ascii_dump : polyhedron -> string
val ppl_Polyhedron_external_memory_in_bytes : polyhedron -> int
val ppl_Polyhedron_total_memory_in_bytes : polyhedron -> int
val ppl_Polyhedron_BHRZ03_widening_assign_with_tokens :
  polyhedron -> polyhedron -> int -> int
val ppl_Polyhedron_H79_widening_assign_with_tokens :
  polyhedron -> polyhedron -> int -> int
val ppl_Polyhedron_BHRZ03_widening_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_H79_widening_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_widening_assign_with_tokens :
  polyhedron -> polyhedron -> int -> int
val ppl_Polyhedron_widening_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_limited_BHRZ03_extrapolation_assign_with_tokens :
  polyhedron ->
  polyhedron -> constraint_system -> int -> int
val ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign_with_tokens :
  polyhedron ->
  polyhedron -> constraint_system -> int -> int
val ppl_Polyhedron_limited_H79_extrapolation_assign_with_tokens :
  polyhedron ->
  polyhedron -> constraint_system -> int -> int
val ppl_Polyhedron_bounded_H79_extrapolation_assign_with_tokens :
  polyhedron ->
```

```
  polyhedron -> constraint_system -> int -> int
val ppl_Polyhedron_limited_BHRZ03_extrapolation_assign :
  polyhedron ->
  polyhedron -> constraint_system -> unit
val ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign :
  polyhedron ->
  polyhedron -> constraint_system -> unit
val ppl_Polyhedron_limited_H79_extrapolation_assign :
  polyhedron ->
  polyhedron -> constraint_system -> unit
val ppl_Polyhedron_bounded_H79_extrapolation_assign :
  polyhedron ->
  polyhedron -> constraint_system -> unit
val ppl_Polyhedron_linear_partition :
  polyhedron ->
  polyhedron ->
  polyhedron * pointset_powerset_nnc_polyhedron
val ppl_Polyhedron_wrap_assign :
  polyhedron ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_C_Polyhedron : polyhedron -> bool
val ppl_termination_test_PR_C_Polyhedron : polyhedron -> bool
val ppl_termination_test_MS_NNC_Polyhedron : polyhedron -> bool
val ppl_termination_test_PR_NNC_Polyhedron : polyhedron -> bool
val ppl_one_affine_ranking_function_MS_C_Polyhedron :
  polyhedron -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_C_Polyhedron :
  polyhedron -> bool * linear_generator
val ppl_one_affine_ranking_function_MS_NNC_Polyhedron :
  polyhedron -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_NNC_Polyhedron :
  polyhedron -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_C_Polyhedron :
  polyhedron -> polyhedron
val ppl_all_affine_ranking_functions_PR_C_Polyhedron :
  polyhedron -> polyhedron
val ppl_all_affine_ranking_functions_MS_NNC_Polyhedron :
  polyhedron -> polyhedron
val ppl_all_affine_ranking_functions_PR_NNC_Polyhedron :
  polyhedron -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_C_Polyhedron :
  polyhedron -> polyhedron * polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_NNC_Polyhedron :
  polyhedron -> polyhedron * polyhedron
val ppl_termination_test_MS_C_Polyhedron_2 : polyhedron -> polyhedron -> bool
```

```
val ppl_termination_test_PR_C_Polyhedron_2 : polyhedron -> polyhedron -> bool
val ppl_termination_test_MS_NNC_Polyhedron_2 :
  polyhedron -> polyhedron -> bool
val ppl_termination_test_PR_NNC_Polyhedron_2 :
  polyhedron -> polyhedron -> bool
val ppl_one_affine_ranking_function_MS_C_Polyhedron_2 :
  polyhedron ->
  polyhedron -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_C_Polyhedron_2 :
  polyhedron ->
  polyhedron -> bool * linear_generator
val ppl_one_affine_ranking_function_MS_NNC_Polyhedron_2 :
  polyhedron ->
  polyhedron -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_NNC_Polyhedron_2 :
  polyhedron ->
  polyhedron -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_C_Polyhedron_2 :
  polyhedron -> polyhedron -> polyhedron
val ppl_all_affine_ranking_functions_PR_C_Polyhedron_2 :
  polyhedron -> polyhedron -> polyhedron
val ppl_all_affine_ranking_functions_MS_NNC_Polyhedron_2 :
  polyhedron -> polyhedron -> polyhedron
val ppl_all_affine_ranking_functions_PR_NNC_Polyhedron_2 :
  polyhedron -> polyhedron -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_C_Polyhedron_2 :
  polyhedron ->
  polyhedron -> polyhedron * polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_NNC_Polyhedron_2 :
  polyhedron ->
  polyhedron -> polyhedron * polyhedron
val ppl_new_Grid_from_space_dimension : int -> degenerate_element -> grid
val ppl_new_Grid_from_Int8_Box : int8_box -> grid
val ppl_new_Grid_from_Int16_Box : int16_box -> grid
val ppl_new_Grid_from_Int32_Box : int32_box -> grid
val ppl_new_Grid_from_Int64_Box : int64_box -> grid
val ppl_new_Grid_from_Uint8_Box : uint8_box -> grid
val ppl_new_Grid_from_Uint16_Box : uint16_box -> grid
val ppl_new_Grid_from_Uint32_Box : uint32_box -> grid
val ppl_new_Grid_from_Uint64_Box : uint64_box -> grid
val ppl_new_Grid_from_Z_Box : z_box -> grid
val ppl_new_Grid_from_Rational_Box : rational_box -> grid
val ppl_new_Grid_from_BD_Shape_int8_t : bd_shape_int8_t -> grid
val ppl_new_Grid_from_BD_Shape_int16_t : bd_shape_int16_t -> grid
val ppl_new_Grid_from_BD_Shape_int32_t : bd_shape_int32_t -> grid
val ppl_new_Grid_from_BD_Shape_int64_t : bd_shape_int64_t -> grid
val ppl_new_Grid_from_BD_Shape_mpz_class : bd_shape_mpz_class -> grid
```

```
val ppl_new_Grid_from_BD_Shape_mpq_class : bd_shape_mpq_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_int8_t : octagonal_shape_int8_t -> grid
val ppl_new_Grid_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> grid
val ppl_new_Grid_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> grid
val ppl_new_Grid_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> grid
val ppl_new_Grid_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> grid
val ppl_new_Grid_from_C_Polyhedron : polyhedron -> grid
val ppl_new_Grid_from_NNC_Polyhedron : polyhedron -> grid
val ppl_new_Grid_from_Grid : grid -> grid
val ppl_new_Grid_from_Float_Box : float_box -> grid
val ppl_new_Grid_from_BD_Shape_float : bd_shape_float -> grid
val ppl_new_Grid_from_Octagonal_Shape_float : octagonal_shape_float -> grid
val ppl_new_Grid_from_Double_Box : double_box -> grid
val ppl_new_Grid_from_BD_Shape_double : bd_shape_double -> grid
val ppl_new_Grid_from_Octagonal_Shape_double : octagonal_shape_double -> grid
val ppl_new_Grid_from_Long_Double_Box : long_double_box -> grid
val ppl_new_Grid_from_BD_Shape_long_double : bd_shape_long_double -> grid
val ppl_new_Grid_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> grid
val ppl_new_Grid_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> grid
val ppl_new_Grid_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> grid
val ppl_new_Grid_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> grid
val ppl_new_Grid_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> grid
val ppl_new_Grid_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> grid
val ppl_new_Grid_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> grid
val ppl_new_Grid_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> grid
val ppl_new_Grid_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> grid
val ppl_new_Grid_from_Z_Box_with_complexity :
  z_box -> complexity_class -> grid
val ppl_new_Grid_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t -> complexity_class -> grid
```

```
val ppl_new_Grid_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class -> complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> grid
val ppl_new_Grid_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> grid
val ppl_new_Grid_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> grid
val ppl_new_Grid_from_Grid_with_complexity : grid -> complexity_class -> grid
val ppl_new_Grid_from_Float_Box_with_complexity :
  float_box -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> grid
val ppl_new_Grid_from_Double_Box_with_complexity :
  double_box -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_double_with_complexity :
  bd_shape_double -> complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> grid
val ppl_new_Grid_from_Long_Double_Box_with_complexity :
  long_double_box -> complexity_class -> grid
```

```
val ppl_new_Grid_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> grid
val ppl_new_Grid_from_constraints : constraint_system -> grid
val ppl_new_Grid_from_congruences : congruence_system -> grid
val ppl_new_Grid_from_grid_generators : grid_generator_system -> grid
val ppl_Grid_swap : grid -> grid -> unit
val ppl_Grid_space_dimension : grid -> int
val ppl_Grid_affine_dimension : grid -> int
val ppl_Grid_relation_with_constraint :
  grid ->
  linear_constraint -> poly_con_relation list
val ppl_Grid_relation_with_generator :
  grid ->
  linear_generator -> poly_gen_relation list
val ppl_Grid_relation_with_congruence :
  grid ->
  linear_congruence -> poly_con_relation list
val ppl_Grid_relation_with_grid_generator :
  grid ->
  linear_grid_generator -> poly_gen_relation list
val ppl_Grid_get_constraints : grid -> constraint_system
val ppl_Grid_get_congruences : grid -> congruence_system
val ppl_Grid_get_grid_generators : grid -> grid_generator_system
val ppl_Grid_get_minimized_constraints : grid -> constraint_system
val ppl_Grid_get_minimized_congruences : grid -> congruence_system
val ppl_Grid_get_minimized_grid_generators : grid -> grid_generator_system
val ppl_Grid_is_empty : grid -> bool
val ppl_Grid_is_universe : grid -> bool
val ppl_Grid_is_bounded : grid -> bool
val ppl_Grid_contains_integer_point : grid -> bool
val ppl_Grid_is_topologically_closed : grid -> bool
val ppl_Grid_is_discrete : grid -> bool
val ppl_Grid_topological_closure_assign : grid -> unit
val ppl_Grid_bounds_from_above : grid -> linear_expression -> bool
val ppl_Grid_bounds_from_below : grid -> linear_expression -> bool
val ppl_Grid_maximize :
  grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Grid_minimize :
  grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Grid_maximize_with_point :
  grid ->
```

```
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Grid_minimize_with_point :
  grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Grid_frequency :
  grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Grid_contains_Grid : grid -> grid -> bool
val ppl_Grid_strictly_contains_Grid : grid -> grid -> bool
val ppl_Grid_is_disjoint_from_Grid : grid -> grid -> bool
val ppl_Grid_equals_Grid : grid -> grid -> bool
val ppl_Grid_OK : grid -> bool
val ppl_Grid_add_constraint : grid -> linear_constraint -> unit
val ppl_Grid_add_congruence : grid -> linear_congruence -> unit
val ppl_Grid_add_grid_generator : grid -> linear_grid_generator -> unit
val ppl_Grid_add_constraints : grid -> constraint_system -> unit
val ppl_Grid_add_congruences : grid -> congruence_system -> unit
val ppl_Grid_add_grid_generators : grid -> grid_generator_system -> unit
val ppl_Grid_refine_with_constraint : grid -> linear_constraint -> unit
val ppl_Grid_refine_with_congruence : grid -> linear_congruence -> unit
val ppl_Grid_refine_with_constraints : grid -> constraint_system -> unit
val ppl_Grid_refine_with_congruences : grid -> congruence_system -> unit
val ppl_Grid_intersection_assign : grid -> grid -> unit
val ppl_Grid_upper_bound_assign : grid -> grid -> unit
val ppl_Grid_difference_assign : grid -> grid -> unit
val ppl_Grid_concatenate_assign : grid -> grid -> unit
val ppl_Grid_time_elapse_assign : grid -> grid -> unit
val ppl_Grid_upper_bound_assign_if_exact : grid -> grid -> bool
val ppl_Grid_simplify_using_context_assign : grid -> grid -> bool
val ppl_Grid_constrains : grid -> int -> bool
val ppl_Grid_unconstrain_space_dimension : grid -> int -> unit
val ppl_Grid_unconstrain_space_dimensions : grid -> int list -> unit
val ppl_Grid_affine_image :
  grid -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_affine_preimage :
  grid -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_bounded_affine_image :
  grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_bounded_affine_preimage :
  grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Grid_generalized_affine_image :
  grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_generalized_affine_preimage :
  grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_generalized_affine_image_lhs_rhs :
  grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Grid_generalized_affine_preimage_lhs_rhs :
  grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Grid_generalized_affine_image_with_congruence :
  grid ->
  int ->
  relation_symbol ->
  linear_expression -> Gmp.Z.t -> Gmp.Z.t -> unit
val ppl_Grid_generalized_affine_preimage_with_congruence :
  grid ->
  int ->
  relation_symbol ->
  linear_expression -> Gmp.Z.t -> Gmp.Z.t -> unit
val ppl_Grid_generalized_affine_image_lhs_rhs_with_congruence :
  grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_generalized_affine_preimage_lhs_rhs_with_congruence :
  grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_add_space_dimensions_and_embed : grid -> int -> unit
val ppl_Grid_add_space_dimensions_and_project : grid -> int -> unit
val ppl_Grid_remove_space_dimensions : grid -> int list -> unit
val ppl_Grid_remove_higher_space_dimensions : grid -> int -> unit
val ppl_Grid_expand_space_dimension : grid -> int -> int -> unit
val ppl_Grid_fold_space_dimensions : grid -> int list -> int -> unit
val ppl_Grid_map_space_dimensions : grid -> (int * int) list -> unit
val ppl_Grid_drop_some_non_integer_points : grid -> complexity_class -> unit
val ppl_Grid_drop_some_non_integer_points_2 :
  grid -> int list -> complexity_class -> unit
val ppl_Grid_ascii_dump : grid -> string
val ppl_Grid_external_memory_in_bytes : grid -> int
val ppl_Grid_total_memory_in_bytes : grid -> int
val ppl_Grid_congruence_widening_assign_with_tokens :
  grid -> grid -> int -> int
```

```
val ppl_Grid_generator_widening_assign_with_tokens :
  grid -> grid -> int -> int
val ppl_Grid_congruence_widening_assign : grid -> grid -> unit
val ppl_Grid_generator_widening_assign : grid -> grid -> unit
val ppl_Grid_widening_assign_with_tokens : grid -> grid -> int -> int
val ppl_Grid_widening_assign : grid -> grid -> unit
val ppl_Grid_limited_congruence_extrapolation_assign_with_tokens :
  grid -> grid -> congruence_system -> int -> int
val ppl_Grid_limited_generator_extrapolation_assign_with_tokens :
  grid -> grid -> congruence_system -> int -> int
val ppl_Grid_limited_congruence_extrapolation_assign :
  grid -> grid -> congruence_system -> unit
val ppl_Grid_limited_generator_extrapolation_assign :
  grid -> grid -> congruence_system -> unit
val ppl_Grid_approximate_partition :
  grid ->
  grid -> grid * pointset_powerset_grid * bool
val ppl_Grid_wrap_assign :
  grid ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Grid : grid -> bool
val ppl_termination_test_PR_Grid : grid -> bool
val ppl_one_affine_ranking_function_MS_Grid : grid -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Grid : grid -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Grid : grid -> polyhedron
val ppl_all_affine_ranking_functions_PR_Grid : grid -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Grid :
  grid -> polyhedron * polyhedron
val ppl_termination_test_MS_Grid_2 : grid -> grid -> bool
val ppl_termination_test_PR_Grid_2 : grid -> grid -> bool
val ppl_one_affine_ranking_function_MS_Grid_2 :
  grid -> grid -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Grid_2 :
  grid -> grid -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Grid_2 : grid -> grid -> polyhedron
val ppl_all_affine_ranking_functions_PR_Grid_2 : grid -> grid -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Grid_2 :
  grid ->
  grid -> polyhedron * polyhedron
val ppl_new_Pointset_Powerset_Int8_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_int8_box
val ppl_new_Pointset_Powerset_Int8_Box_from_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box -> pointset_powerset_int8_box
```

```
val ppl_new_Pointset_Powerset_Int8_Box_from_Int8_Box :
  int8_box -> pointset_powerset_int8_box
val ppl_new_Pointset_Powerset_Int8_Box_from_Pointset_Powerset_Int8_Box_with_complexit
  pointset_powerset_int8_box ->
  complexity_class -> pointset_powerset_int8_box
val ppl_new_Pointset_Powerset_Int8_Box_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> pointset_powerset_int8_box
val ppl_new_Pointset_Powerset_Int8_Box_from_constraints :
  constraint_system -> pointset_powerset_int8_box
val ppl_new_Pointset_Powerset_Int8_Box_from_congruences :
  congruence_system -> pointset_powerset_int8_box
val ppl_Pointset_Powerset_Int8_Box_swap :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_space_dimension :
  pointset_powerset_int8_box -> int
val ppl_Pointset_Powerset_Int8_Box_affine_dimension :
  pointset_powerset_int8_box -> int
val ppl_Pointset_Powerset_Int8_Box_relation_with_constraint :
  pointset_powerset_int8_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Int8_Box_relation_with_generator :
  pointset_powerset_int8_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Int8_Box_relation_with_congruence :
  pointset_powerset_int8_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Int8_Box_is_empty :
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_is_universe :
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_is_bounded :
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_contains_integer_point :
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_is_topologically_closed :
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_is_discrete :
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_topological_closure_assign :
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_pairwise_reduce :
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_omega_reduce :
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_bounds_from_above :
  pointset_powerset_int8_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int8_Box_bounds_from_below :
```

```
  pointset_powerset_int8_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int8_Box_maximize :
  pointset_powerset_int8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int8_Box_minimize :
  pointset_powerset_int8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int8_Box_maximize_with_point :
  pointset_powerset_int8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int8_Box_minimize_with_point :
  pointset_powerset_int8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int8_Box_contains_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_strictly_contains_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_is_disjoint_from_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_geometrically_covers_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_geometrically_equals_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_equals_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_OK : pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_add_constraint :
  pointset_powerset_int8_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int8_Box_add_congruence :
  pointset_powerset_int8_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int8_Box_add_constraints :
  pointset_powerset_int8_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int8_Box_add_congruences :
  pointset_powerset_int8_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int8_Box_refine_with_constraint :
  pointset_powerset_int8_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int8_Box_refine_with_congruence :
  pointset_powerset_int8_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int8_Box_refine_with_constraints :
  pointset_powerset_int8_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int8_Box_refine_with_congruences :
```

```
  pointset_powerset_int8_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int8_Box_intersection_assign :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_upper_bound_assign :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_difference_assign :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_concatenate_assign :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_time_elapse_assign :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_upper_bound_assign_if_exact :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_simplify_using_context_assign :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_constrains :
  pointset_powerset_int8_box -> int -> bool
val ppl_Pointset_Powerset_Int8_Box_unconstrain_space_dimension :
  pointset_powerset_int8_box -> int -> unit
val ppl_Pointset_Powerset_Int8_Box_unconstrain_space_dimensions :
  pointset_powerset_int8_box -> int list -> unit
val ppl_Pointset_Powerset_Int8_Box_affine_image :
  pointset_powerset_int8_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int8_Box_affine_preimage :
  pointset_powerset_int8_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int8_Box_bounded_affine_image :
  pointset_powerset_int8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int8_Box_bounded_affine_preimage :
  pointset_powerset_int8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int8_Box_generalized_affine_image :
  pointset_powerset_int8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int8_Box_generalized_affine_preimage :
  pointset_powerset_int8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Pointset_Powerset_Int8_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_int8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int8_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_int8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int8_Box_add_space_dimensions_and_embed :
  pointset_powerset_int8_box -> int -> unit
val ppl_Pointset_Powerset_Int8_Box_add_space_dimensions_and_project :
  pointset_powerset_int8_box -> int -> unit
val ppl_Pointset_Powerset_Int8_Box_remove_space_dimensions :
  pointset_powerset_int8_box -> int list -> unit
val ppl_Pointset_Powerset_Int8_Box_remove_higher_space_dimensions :
  pointset_powerset_int8_box -> int -> unit
val ppl_Pointset_Powerset_Int8_Box_expand_space_dimension :
  pointset_powerset_int8_box -> int -> int -> unit
val ppl_Pointset_Powerset_Int8_Box_fold_space_dimensions :
  pointset_powerset_int8_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Int8_Box_map_space_dimensions :
  pointset_powerset_int8_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Int8_Box_drop_some_non_integer_points :
  pointset_powerset_int8_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Int8_Box_drop_some_non_integer_points_2 :
  pointset_powerset_int8_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Int8_Box_ascii_dump :
  pointset_powerset_int8_box -> string
val ppl_Pointset_Powerset_Int8_Box_external_memory_in_bytes :
  pointset_powerset_int8_box -> int
val ppl_Pointset_Powerset_Int8_Box_total_memory_in_bytes :
  pointset_powerset_int8_box -> int
val ppl_Pointset_Powerset_Int8_Box_size : pointset_powerset_int8_box -> int
type pointset_powerset_int8_box_iterator
val ppl_new_Pointset_Powerset_Int8_Box_iterator_from_iterator :
  pointset_powerset_int8_box_iterator ->
  pointset_powerset_int8_box_iterator
val ppl_Pointset_Powerset_Int8_Box_begin_iterator :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box_iterator
val ppl_Pointset_Powerset_Int8_Box_end_iterator :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box_iterator
val ppl_Pointset_Powerset_Int8_Box_iterator_equals_iterator :
  pointset_powerset_int8_box_iterator ->
  pointset_powerset_int8_box_iterator -> bool
val ppl_Pointset_Powerset_Int8_Box_increment_iterator :
  pointset_powerset_int8_box_iterator -> unit
```

```
val ppl_Pointset_Powerset_Int8_Box_decrement_iterator :
  pointset_powerset_int8_box_iterator -> unit
val ppl_Pointset_Powerset_Int8_Box_get_disjunct :
  pointset_powerset_int8_box_iterator -> int8_box
val ppl_Pointset_Powerset_Int8_Box_add_disjunct :
  pointset_powerset_int8_box -> int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_drop_disjunct :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box_iterator -> unit
val ppl_Pointset_Powerset_Int8_Box_drop_disjuncts :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box_iterator ->
  pointset_powerset_int8_box_iterator -> unit
val ppl_new_Pointset_Powerset_Int16_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_int16_box
val ppl_new_Pointset_Powerset_Int16_Box_from_Pointset_Powerset_Int16_Box :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box
val ppl_new_Pointset_Powerset_Int16_Box_from_Int16_Box :
  int16_box -> pointset_powerset_int16_box
val ppl_new_Pointset_Powerset_Int16_Box_from_Pointset_Powerset_Int16_Box_with_complex
  pointset_powerset_int16_box ->
  complexity_class -> pointset_powerset_int16_box
val ppl_new_Pointset_Powerset_Int16_Box_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> pointset_powerset_int16_box
val ppl_new_Pointset_Powerset_Int16_Box_from_constraints :
  constraint_system -> pointset_powerset_int16_box
val ppl_new_Pointset_Powerset_Int16_Box_from_congruences :
  congruence_system -> pointset_powerset_int16_box
val ppl_Pointset_Powerset_Int16_Box_swap :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_space_dimension :
  pointset_powerset_int16_box -> int
val ppl_Pointset_Powerset_Int16_Box_affine_dimension :
  pointset_powerset_int16_box -> int
val ppl_Pointset_Powerset_Int16_Box_relation_with_constraint :
  pointset_powerset_int16_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Int16_Box_relation_with_generator :
  pointset_powerset_int16_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Int16_Box_relation_with_congruence :
  pointset_powerset_int16_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Int16_Box_is_empty :
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_is_universe :
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```
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_is_bounded :
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_contains_integer_point :
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_is_topologically_closed :
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_is_discrete :
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_topological_closure_assign :
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_pairwise_reduce :
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_omega_reduce :
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_bounds_from_above :
  pointset_powerset_int16_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int16_Box_bounds_from_below :
  pointset_powerset_int16_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int16_Box_maximize :
  pointset_powerset_int16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int16_Box_minimize :
  pointset_powerset_int16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int16_Box_maximize_with_point :
  pointset_powerset_int16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int16_Box_minimize_with_point :
  pointset_powerset_int16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int16_Box_contains_Pointset_Powerset_Int16_Box :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_strictly_contains_Pointset_Powerset_Int16_Box :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_is_disjoint_from_Pointset_Powerset_Int16_Box :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_geometrically_covers_Pointset_Powerset_Int16_Box
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_geometrically_equals_Pointset_Powerset_Int16_Box
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_equals_Pointset_Powerset_Int16_Box :
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  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_OK : pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_add_constraint :
  pointset_powerset_int16_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int16_Box_add_congruence :
  pointset_powerset_int16_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int16_Box_add_constraints :
  pointset_powerset_int16_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int16_Box_add_congruences :
  pointset_powerset_int16_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int16_Box_refine_with_constraint :
  pointset_powerset_int16_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int16_Box_refine_with_congruence :
  pointset_powerset_int16_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int16_Box_refine_with_constraints :
  pointset_powerset_int16_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int16_Box_refine_with_congruences :
  pointset_powerset_int16_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int16_Box_intersection_assign :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_upper_bound_assign :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_difference_assign :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_concatenate_assign :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_time_elapse_assign :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_upper_bound_assign_if_exact :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_simplify_using_context_assign :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_constrains :
  pointset_powerset_int16_box -> int -> bool
val ppl_Pointset_Powerset_Int16_Box_unconstrain_space_dimension :
  pointset_powerset_int16_box -> int -> unit
val ppl_Pointset_Powerset_Int16_Box_unconstrain_space_dimensions :
  pointset_powerset_int16_box -> int list -> unit
val ppl_Pointset_Powerset_Int16_Box_affine_image :
  pointset_powerset_int16_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Pointset_Powerset_Int16_Box_affine_preimage :
  pointset_powerset_int16_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int16_Box_bounded_affine_image :
  pointset_powerset_int16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int16_Box_bounded_affine_preimage :
  pointset_powerset_int16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int16_Box_generalized_affine_image :
  pointset_powerset_int16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int16_Box_generalized_affine_preimage :
  pointset_powerset_int16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int16_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_int16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int16_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_int16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int16_Box_add_space_dimensions_and_embed :
  pointset_powerset_int16_box -> int -> unit
val ppl_Pointset_Powerset_Int16_Box_add_space_dimensions_and_project :
  pointset_powerset_int16_box -> int -> unit
val ppl_Pointset_Powerset_Int16_Box_remove_space_dimensions :
  pointset_powerset_int16_box -> int list -> unit
val ppl_Pointset_Powerset_Int16_Box_remove_higher_space_dimensions :
  pointset_powerset_int16_box -> int -> unit
val ppl_Pointset_Powerset_Int16_Box_expand_space_dimension :
  pointset_powerset_int16_box -> int -> int -> unit
val ppl_Pointset_Powerset_Int16_Box_fold_space_dimensions :
  pointset_powerset_int16_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Int16_Box_map_space_dimensions :
  pointset_powerset_int16_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Int16_Box_drop_some_non_integer_points :
  pointset_powerset_int16_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Int16_Box_drop_some_non_integer_points_2 :
  pointset_powerset_int16_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Int16_Box_ascii_dump :
  pointset_powerset_int16_box -> string
val ppl_Pointset_Powerset_Int16_Box_external_memory_in_bytes :
  pointset_powerset_int16_box -> int
```

```
val ppl_Pointset_Powerset_Int16_Box_total_memory_in_bytes :
  pointset_powerset_int16_box -> int
val ppl_Pointset_Powerset_Int16_Box_size : pointset_powerset_int16_box -> int
type pointset_powerset_int16_box_iterator
val ppl_new_Pointset_Powerset_Int16_Box_iterator_from_iterator :
  pointset_powerset_int16_box_iterator ->
  pointset_powerset_int16_box_iterator
val ppl_Pointset_Powerset_Int16_Box_begin_iterator :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box_iterator
val ppl_Pointset_Powerset_Int16_Box_end_iterator :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box_iterator
val ppl_Pointset_Powerset_Int16_Box_iterator_equals_iterator :
  pointset_powerset_int16_box_iterator ->
  pointset_powerset_int16_box_iterator -> bool
val ppl_Pointset_Powerset_Int16_Box_increment_iterator :
  pointset_powerset_int16_box_iterator -> unit
val ppl_Pointset_Powerset_Int16_Box_decrement_iterator :
  pointset_powerset_int16_box_iterator -> unit
val ppl_Pointset_Powerset_Int16_Box_get_disjunct :
  pointset_powerset_int16_box_iterator -> int16_box
val ppl_Pointset_Powerset_Int16_Box_add_disjunct :
  pointset_powerset_int16_box -> int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_drop_disjunct :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box_iterator -> unit
val ppl_Pointset_Powerset_Int16_Box_drop_disjuncts :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box_iterator ->
  pointset_powerset_int16_box_iterator -> unit
val ppl_new_Pointset_Powerset_Int32_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_int32_box
val ppl_new_Pointset_Powerset_Int32_Box_from_Pointset_Powerset_Int32_Box :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box
val ppl_new_Pointset_Powerset_Int32_Box_from_Int32_Box :
  int32_box -> pointset_powerset_int32_box
val ppl_new_Pointset_Powerset_Int32_Box_from_Pointset_Powerset_Int32_Box_with_complex
  pointset_powerset_int32_box ->
  complexity_class -> pointset_powerset_int32_box
val ppl_new_Pointset_Powerset_Int32_Box_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> pointset_powerset_int32_box
val ppl_new_Pointset_Powerset_Int32_Box_from_constraints :
  constraint_system -> pointset_powerset_int32_box
val ppl_new_Pointset_Powerset_Int32_Box_from_congruences :
  congruence_system -> pointset_powerset_int32_box
val ppl_Pointset_Powerset_Int32_Box_swap :
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```
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_space_dimension :
  pointset_powerset_int32_box -> int
val ppl_Pointset_Powerset_Int32_Box_affine_dimension :
  pointset_powerset_int32_box -> int
val ppl_Pointset_Powerset_Int32_Box_relation_with_constraint :
  pointset_powerset_int32_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Int32_Box_relation_with_generator :
  pointset_powerset_int32_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Int32_Box_relation_with_congruence :
  pointset_powerset_int32_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Int32_Box_is_empty :
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_is_universe :
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_is_bounded :
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_contains_integer_point :
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_is_topologically_closed :
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_is_discrete :
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_topological_closure_assign :
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_pairwise_reduce :
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_omega_reduce :
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_bounds_from_above :
  pointset_powerset_int32_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int32_Box_bounds_from_below :
  pointset_powerset_int32_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int32_Box_maximize :
  pointset_powerset_int32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int32_Box_minimize :
  pointset_powerset_int32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int32_Box_maximize_with_point :
  pointset_powerset_int32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int32_Box_minimize_with_point :
  pointset_powerset_int32_box ->
```

```
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int32_Box_contains_Pointset_Powerset_Int32_Box :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_strictly_contains_Pointset_Powerset_Int32_Box :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_is_disjoint_from_Pointset_Powerset_Int32_Box :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_geometrically_covers_Pointset_Powerset_Int32_Box
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_geometrically_equals_Pointset_Powerset_Int32_Box
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_equals_Pointset_Powerset_Int32_Box :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_OK : pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_add_constraint :
  pointset_powerset_int32_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int32_Box_add_congruence :
  pointset_powerset_int32_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int32_Box_add_constraints :
  pointset_powerset_int32_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int32_Box_add_congruences :
  pointset_powerset_int32_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int32_Box_refine_with_constraint :
  pointset_powerset_int32_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int32_Box_refine_with_congruence :
  pointset_powerset_int32_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int32_Box_refine_with_constraints :
  pointset_powerset_int32_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int32_Box_refine_with_congruences :
  pointset_powerset_int32_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int32_Box_intersection_assign :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_upper_bound_assign :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_difference_assign :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_concatenate_assign :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> unit
```

```
val ppl_Pointset_Powerset_Int32_Box_time_elapse_assign :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_upper_bound_assign_if_exact :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_simplify_using_context_assign :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_constrains :
  pointset_powerset_int32_box -> int -> bool
val ppl_Pointset_Powerset_Int32_Box_unconstrain_space_dimension :
  pointset_powerset_int32_box -> int -> unit
val ppl_Pointset_Powerset_Int32_Box_unconstrain_space_dimensions :
  pointset_powerset_int32_box -> int list -> unit
val ppl_Pointset_Powerset_Int32_Box_affine_image :
  pointset_powerset_int32_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int32_Box_affine_preimage :
  pointset_powerset_int32_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int32_Box_bounded_affine_image :
  pointset_powerset_int32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int32_Box_bounded_affine_preimage :
  pointset_powerset_int32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int32_Box_generalized_affine_image :
  pointset_powerset_int32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int32_Box_generalized_affine_preimage :
  pointset_powerset_int32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int32_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_int32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int32_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_int32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int32_Box_add_space_dimensions_and_embed :
  pointset_powerset_int32_box -> int -> unit
val ppl_Pointset_Powerset_Int32_Box_add_space_dimensions_and_project :
  pointset_powerset_int32_box -> int -> unit
val ppl_Pointset_Powerset_Int32_Box_remove_space_dimensions :
```

```
  pointset_powerset_int32_box -> int list -> unit
val ppl_Pointset_Powerset_Int32_Box_remove_higher_space_dimensions :
  pointset_powerset_int32_box -> int -> unit
val ppl_Pointset_Powerset_Int32_Box_expand_space_dimension :
  pointset_powerset_int32_box -> int -> int -> unit
val ppl_Pointset_Powerset_Int32_Box_fold_space_dimensions :
  pointset_powerset_int32_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Int32_Box_map_space_dimensions :
  pointset_powerset_int32_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Int32_Box_drop_some_non_integer_points :
  pointset_powerset_int32_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Int32_Box_drop_some_non_integer_points_2 :
  pointset_powerset_int32_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Int32_Box_ascii_dump :
  pointset_powerset_int32_box -> string
val ppl_Pointset_Powerset_Int32_Box_external_memory_in_bytes :
  pointset_powerset_int32_box -> int
val ppl_Pointset_Powerset_Int32_Box_total_memory_in_bytes :
  pointset_powerset_int32_box -> int
val ppl_Pointset_Powerset_Int32_Box_size : pointset_powerset_int32_box -> int
type pointset_powerset_int32_box_iterator
val ppl_new_Pointset_Powerset_Int32_Box_iterator_from_iterator :
  pointset_powerset_int32_box_iterator ->
  pointset_powerset_int32_box_iterator
val ppl_Pointset_Powerset_Int32_Box_begin_iterator :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box_iterator
val ppl_Pointset_Powerset_Int32_Box_end_iterator :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box_iterator
val ppl_Pointset_Powerset_Int32_Box_iterator_equals_iterator :
  pointset_powerset_int32_box_iterator ->
  pointset_powerset_int32_box_iterator -> bool
val ppl_Pointset_Powerset_Int32_Box_increment_iterator :
  pointset_powerset_int32_box_iterator -> unit
val ppl_Pointset_Powerset_Int32_Box_decrement_iterator :
  pointset_powerset_int32_box_iterator -> unit
val ppl_Pointset_Powerset_Int32_Box_get_disjunct :
  pointset_powerset_int32_box_iterator -> int32_box
val ppl_Pointset_Powerset_Int32_Box_add_disjunct :
  pointset_powerset_int32_box -> int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_drop_disjunct :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box_iterator -> unit
val ppl_Pointset_Powerset_Int32_Box_drop_disjuncts :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box_iterator ->
  pointset_powerset_int32_box_iterator -> unit
```

```
val ppl_new_Pointset_Powerset_Int64_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_int64_box
val ppl_new_Pointset_Powerset_Int64_Box_from_Pointset_Powerset_Int64_Box :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box
val ppl_new_Pointset_Powerset_Int64_Box_from_Int64_Box :
  int64_box -> pointset_powerset_int64_box
val ppl_new_Pointset_Powerset_Int64_Box_from_Pointset_Powerset_Int64_Box_with_complex
  pointset_powerset_int64_box ->
  complexity_class -> pointset_powerset_int64_box
val ppl_new_Pointset_Powerset_Int64_Box_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> pointset_powerset_int64_box
val ppl_new_Pointset_Powerset_Int64_Box_from_constraints :
  constraint_system -> pointset_powerset_int64_box
val ppl_new_Pointset_Powerset_Int64_Box_from_congruences :
  congruence_system -> pointset_powerset_int64_box
val ppl_Pointset_Powerset_Int64_Box_swap :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_space_dimension :
  pointset_powerset_int64_box -> int
val ppl_Pointset_Powerset_Int64_Box_affine_dimension :
  pointset_powerset_int64_box -> int
val ppl_Pointset_Powerset_Int64_Box_relation_with_constraint :
  pointset_powerset_int64_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Int64_Box_relation_with_generator :
  pointset_powerset_int64_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Int64_Box_relation_with_congruence :
  pointset_powerset_int64_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Int64_Box_is_empty :
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_is_universe :
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_is_bounded :
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_contains_integer_point :
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_is_topologically_closed :
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_is_discrete :
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_topological_closure_assign :
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_pairwise_reduce :
  pointset_powerset_int64_box -> unit
```

```
val ppl_Pointset_Powerset_Int64_Box_omega_reduce :
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_bounds_from_above :
  pointset_powerset_int64_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int64_Box_bounds_from_below :
  pointset_powerset_int64_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int64_Box_maximize :
  pointset_powerset_int64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int64_Box_minimize :
  pointset_powerset_int64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int64_Box_maximize_with_point :
  pointset_powerset_int64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int64_Box_minimize_with_point :
  pointset_powerset_int64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int64_Box_contains_Pointset_Powerset_Int64_Box :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_strictly_contains_Pointset_Powerset_Int64_Box :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_is_disjoint_from_Pointset_Powerset_Int64_Box :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_geometrically_covers_Pointset_Powerset_Int64_Box
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_geometrically_equals_Pointset_Powerset_Int64_Box
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_equals_Pointset_Powerset_Int64_Box :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_OK : pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_add_constraint :
  pointset_powerset_int64_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int64_Box_add_congruence :
  pointset_powerset_int64_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int64_Box_add_constraints :
  pointset_powerset_int64_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int64_Box_add_congruences :
  pointset_powerset_int64_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int64_Box_refine_with_constraint :
  pointset_powerset_int64_box -> linear_constraint -> unit
```

```
val ppl_Pointset_Powerset_Int64_Box_refine_with_congruence :
  pointset_powerset_int64_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int64_Box_refine_with_constraints :
  pointset_powerset_int64_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int64_Box_refine_with_congruences :
  pointset_powerset_int64_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int64_Box_intersection_assign :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_upper_bound_assign :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_difference_assign :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_concatenate_assign :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_time_elapse_assign :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_upper_bound_assign_if_exact :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_simplify_using_context_assign :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_constrains :
  pointset_powerset_int64_box -> int -> bool
val ppl_Pointset_Powerset_Int64_Box_unconstrain_space_dimension :
  pointset_powerset_int64_box -> int -> unit
val ppl_Pointset_Powerset_Int64_Box_unconstrain_space_dimensions :
  pointset_powerset_int64_box -> int list -> unit
val ppl_Pointset_Powerset_Int64_Box_affine_image :
  pointset_powerset_int64_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int64_Box_affine_preimage :
  pointset_powerset_int64_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int64_Box_bounded_affine_image :
  pointset_powerset_int64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int64_Box_bounded_affine_preimage :
  pointset_powerset_int64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int64_Box_generalized_affine_image :
  pointset_powerset_int64_box ->
  int ->
```

```
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int64_Box_generalized_affine_preimage :
  pointset_powerset_int64_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int64_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_int64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int64_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_int64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int64_Box_add_space_dimensions_and_embed :
  pointset_powerset_int64_box -> int -> unit
val ppl_Pointset_Powerset_Int64_Box_add_space_dimensions_and_project :
  pointset_powerset_int64_box -> int -> unit
val ppl_Pointset_Powerset_Int64_Box_remove_space_dimensions :
  pointset_powerset_int64_box -> int list -> unit
val ppl_Pointset_Powerset_Int64_Box_remove_higher_space_dimensions :
  pointset_powerset_int64_box -> int -> unit
val ppl_Pointset_Powerset_Int64_Box_expand_space_dimension :
  pointset_powerset_int64_box -> int -> int -> unit
val ppl_Pointset_Powerset_Int64_Box_fold_space_dimensions :
  pointset_powerset_int64_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Int64_Box_map_space_dimensions :
  pointset_powerset_int64_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Int64_Box_drop_some_non_integer_points :
  pointset_powerset_int64_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Int64_Box_drop_some_non_integer_points_2 :
  pointset_powerset_int64_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Int64_Box_ascii_dump :
  pointset_powerset_int64_box -> string
val ppl_Pointset_Powerset_Int64_Box_external_memory_in_bytes :
  pointset_powerset_int64_box -> int
val ppl_Pointset_Powerset_Int64_Box_total_memory_in_bytes :
  pointset_powerset_int64_box -> int
val ppl_Pointset_Powerset_Int64_Box_size : pointset_powerset_int64_box -> int
type pointset_powerset_int64_box_iterator
val ppl_new_Pointset_Powerset_Int64_Box_iterator_from_iterator :
  pointset_powerset_int64_box_iterator ->
  pointset_powerset_int64_box_iterator
val ppl_Pointset_Powerset_Int64_Box_begin_iterator :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box_iterator
val ppl_Pointset_Powerset_Int64_Box_end_iterator :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box_iterator
```

```
val ppl_Pointset_Powerset_Int64_Box_iterator_equals_iterator :
  pointset_powerset_int64_box_iterator ->
  pointset_powerset_int64_box_iterator -> bool
val ppl_Pointset_Powerset_Int64_Box_increment_iterator :
  pointset_powerset_int64_box_iterator -> unit
val ppl_Pointset_Powerset_Int64_Box_decrement_iterator :
  pointset_powerset_int64_box_iterator -> unit
val ppl_Pointset_Powerset_Int64_Box_get_disjunct :
  pointset_powerset_int64_box_iterator -> int64_box
val ppl_Pointset_Powerset_Int64_Box_add_disjunct :
  pointset_powerset_int64_box -> int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_drop_disjunct :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box_iterator -> unit
val ppl_Pointset_Powerset_Int64_Box_drop_disjuncts :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box_iterator ->
  pointset_powerset_int64_box_iterator -> unit
val ppl_new_Pointset_Powerset_Uint8_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_uint8_box
val ppl_new_Pointset_Powerset_Uint8_Box_from_Pointset_Powerset_Uint8_Box :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box
val ppl_new_Pointset_Powerset_Uint8_Box_from_Uint8_Box :
  uint8_box -> pointset_powerset_uint8_box
val ppl_new_Pointset_Powerset_Uint8_Box_from_Pointset_Powerset_Uint8_Box_with_complex
  pointset_powerset_uint8_box ->
  complexity_class -> pointset_powerset_uint8_box
val ppl_new_Pointset_Powerset_Uint8_Box_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> pointset_powerset_uint8_box
val ppl_new_Pointset_Powerset_Uint8_Box_from_constraints :
  constraint_system -> pointset_powerset_uint8_box
val ppl_new_Pointset_Powerset_Uint8_Box_from_congruences :
  congruence_system -> pointset_powerset_uint8_box
val ppl_Pointset_Powerset_Uint8_Box_swap :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_space_dimension :
  pointset_powerset_uint8_box -> int
val ppl_Pointset_Powerset_Uint8_Box_affine_dimension :
  pointset_powerset_uint8_box -> int
val ppl_Pointset_Powerset_Uint8_Box_relation_with_constraint :
  pointset_powerset_uint8_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Uint8_Box_relation_with_generator :
  pointset_powerset_uint8_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Uint8_Box_relation_with_congruence :
```

```
  pointset_powerset_uint8_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Uint8_Box_is_empty :
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_is_universe :
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_is_bounded :
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_contains_integer_point :
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_is_topologically_closed :
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_is_discrete :
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_topological_closure_assign :
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_pairwise_reduce :
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_omega_reduce :
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_bounds_from_above :
  pointset_powerset_uint8_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint8_Box_bounds_from_below :
  pointset_powerset_uint8_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint8_Box_maximize :
  pointset_powerset_uint8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint8_Box_minimize :
  pointset_powerset_uint8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint8_Box_maximize_with_point :
  pointset_powerset_uint8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint8_Box_minimize_with_point :
  pointset_powerset_uint8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint8_Box_contains_Pointset_Powerset_Uint8_Box :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_strictly_contains_Pointset_Powerset_Uint8_Box :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_is_disjoint_from_Pointset_Powerset_Uint8_Box :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_geometrically_covers_Pointset_Powerset_Uint8_Box
  pointset_powerset_uint8_box ->
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```
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_geometrically_equals_Pointset_Powerset_Uint8_Box
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_equals_Pointset_Powerset_Uint8_Box :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_OK : pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_add_constraint :
  pointset_powerset_uint8_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint8_Box_add_congruence :
  pointset_powerset_uint8_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint8_Box_add_constraints :
  pointset_powerset_uint8_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint8_Box_add_congruences :
  pointset_powerset_uint8_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint8_Box_refine_with_constraint :
  pointset_powerset_uint8_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint8_Box_refine_with_congruence :
  pointset_powerset_uint8_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint8_Box_refine_with_constraints :
  pointset_powerset_uint8_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint8_Box_refine_with_congruences :
  pointset_powerset_uint8_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint8_Box_intersection_assign :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_upper_bound_assign :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_difference_assign :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_concatenate_assign :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_time_elapse_assign :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_upper_bound_assign_if_exact :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_simplify_using_context_assign :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_constrains :
  pointset_powerset_uint8_box -> int -> bool
val ppl_Pointset_Powerset_Uint8_Box_unconstrain_space_dimension :
  pointset_powerset_uint8_box -> int -> unit
```

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val ppl_Pointset_Powerset_Uint8_Box_unconstrain_space_dimensions :
  pointset_powerset_uint8_box -> int list -> unit
val ppl_Pointset_Powerset_Uint8_Box_affine_image :
  pointset_powerset_uint8_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint8_Box_affine_preimage :
  pointset_powerset_uint8_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint8_Box_bounded_affine_image :
  pointset_powerset_uint8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint8_Box_bounded_affine_preimage :
  pointset_powerset_uint8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint8_Box_generalized_affine_image :
  pointset_powerset_uint8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint8_Box_generalized_affine_preimage :
  pointset_powerset_uint8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint8_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_uint8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint8_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_uint8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint8_Box_add_space_dimensions_and_embed :
  pointset_powerset_uint8_box -> int -> unit
val ppl_Pointset_Powerset_Uint8_Box_add_space_dimensions_and_project :
  pointset_powerset_uint8_box -> int -> unit
val ppl_Pointset_Powerset_Uint8_Box_remove_space_dimensions :
  pointset_powerset_uint8_box -> int list -> unit
val ppl_Pointset_Powerset_Uint8_Box_remove_higher_space_dimensions :
  pointset_powerset_uint8_box -> int -> unit
val ppl_Pointset_Powerset_Uint8_Box_expand_space_dimension :
  pointset_powerset_uint8_box -> int -> int -> unit
val ppl_Pointset_Powerset_Uint8_Box_fold_space_dimensions :
  pointset_powerset_uint8_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Uint8_Box_map_space_dimensions :
  pointset_powerset_uint8_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Uint8_Box_drop_some_non_integer_points :
  pointset_powerset_uint8_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint8_Box_drop_some_non_integer_points_2 :
  pointset_powerset_uint8_box ->
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```
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint8_Box_ascii_dump :
  pointset_powerset_uint8_box -> string
val ppl_Pointset_Powerset_Uint8_Box_external_memory_in_bytes :
  pointset_powerset_uint8_box -> int
val ppl_Pointset_Powerset_Uint8_Box_total_memory_in_bytes :
  pointset_powerset_uint8_box -> int
val ppl_Pointset_Powerset_Uint8_Box_size : pointset_powerset_uint8_box -> int
type pointset_powerset_uint8_box_iterator
val ppl_new_Pointset_Powerset_Uint8_Box_iterator_from_iterator :
  pointset_powerset_uint8_box_iterator ->
  pointset_powerset_uint8_box_iterator
val ppl_Pointset_Powerset_Uint8_Box_begin_iterator :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box_iterator
val ppl_Pointset_Powerset_Uint8_Box_end_iterator :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box_iterator
val ppl_Pointset_Powerset_Uint8_Box_iterator_equals_iterator :
  pointset_powerset_uint8_box_iterator ->
  pointset_powerset_uint8_box_iterator -> bool
val ppl_Pointset_Powerset_Uint8_Box_increment_iterator :
  pointset_powerset_uint8_box_iterator -> unit
val ppl_Pointset_Powerset_Uint8_Box_decrement_iterator :
  pointset_powerset_uint8_box_iterator -> unit
val ppl_Pointset_Powerset_Uint8_Box_get_disjunct :
  pointset_powerset_uint8_box_iterator -> uint8_box
val ppl_Pointset_Powerset_Uint8_Box_add_disjunct :
  pointset_powerset_uint8_box -> uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_drop_disjunct :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box_iterator -> unit
val ppl_Pointset_Powerset_Uint8_Box_drop_disjuncts :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box_iterator ->
  pointset_powerset_uint8_box_iterator -> unit
val ppl_new_Pointset_Powerset_Uint16_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_uint16_box
val ppl_new_Pointset_Powerset_Uint16_Box_from_Pointset_Powerset_Uint16_Box :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box
val ppl_new_Pointset_Powerset_Uint16_Box_from_Uint16_Box :
  uint16_box -> pointset_powerset_uint16_box
val ppl_new_Pointset_Powerset_Uint16_Box_from_Pointset_Powerset_Uint16_Box_with_compl
  pointset_powerset_uint16_box ->
  complexity_class -> pointset_powerset_uint16_box
val ppl_new_Pointset_Powerset_Uint16_Box_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> pointset_powerset_uint16_box
```

```
val ppl_new_Pointset_Powerset_Uint16_Box_from_constraints :
  constraint_system -> pointset_powerset_uint16_box
val ppl_new_Pointset_Powerset_Uint16_Box_from_congruences :
  congruence_system -> pointset_powerset_uint16_box
val ppl_Pointset_Powerset_Uint16_Box_swap :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_space_dimension :
  pointset_powerset_uint16_box -> int
val ppl_Pointset_Powerset_Uint16_Box_affine_dimension :
  pointset_powerset_uint16_box -> int
val ppl_Pointset_Powerset_Uint16_Box_relation_with_constraint :
  pointset_powerset_uint16_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Uint16_Box_relation_with_generator :
  pointset_powerset_uint16_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Uint16_Box_relation_with_congruence :
  pointset_powerset_uint16_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Uint16_Box_is_empty :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_is_universe :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_is_bounded :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_contains_integer_point :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_is_topologically_closed :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_is_discrete :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_topological_closure_assign :
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_pairwise_reduce :
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_omega_reduce :
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_bounds_from_above :
  pointset_powerset_uint16_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint16_Box_bounds_from_below :
  pointset_powerset_uint16_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint16_Box_maximize :
  pointset_powerset_uint16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint16_Box_minimize :
  pointset_powerset_uint16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint16_Box_maximize_with_point :
```

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  pointset_powerset_uint16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint16_Box_minimize_with_point :
  pointset_powerset_uint16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint16_Box_contains_Pointset_Powerset_Uint16_Box :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_strictly_contains_Pointset_Powerset_Uint16_Box :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_is_disjoint_from_Pointset_Powerset_Uint16_Box :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_geometrically_covers_Pointset_Powerset_Uint16_Bo
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_geometrically_equals_Pointset_Powerset_Uint16_Bo
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_equals_Pointset_Powerset_Uint16_Box :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_OK :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_add_constraint :
  pointset_powerset_uint16_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint16_Box_add_congruence :
  pointset_powerset_uint16_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint16_Box_add_constraints :
  pointset_powerset_uint16_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint16_Box_add_congruences :
  pointset_powerset_uint16_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint16_Box_refine_with_constraint :
  pointset_powerset_uint16_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint16_Box_refine_with_congruence :
  pointset_powerset_uint16_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint16_Box_refine_with_constraints :
  pointset_powerset_uint16_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint16_Box_refine_with_congruences :
  pointset_powerset_uint16_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint16_Box_intersection_assign :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_upper_bound_assign :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> unit
```

```
val ppl_Pointset_Powerset_Uint16_Box_difference_assign :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_concatenate_assign :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_time_elapse_assign :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_upper_bound_assign_if_exact :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_simplify_using_context_assign :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_constrains :
  pointset_powerset_uint16_box -> int -> bool
val ppl_Pointset_Powerset_Uint16_Box_unconstrain_space_dimension :
  pointset_powerset_uint16_box -> int -> unit
val ppl_Pointset_Powerset_Uint16_Box_unconstrain_space_dimensions :
  pointset_powerset_uint16_box -> int list -> unit
val ppl_Pointset_Powerset_Uint16_Box_affine_image :
  pointset_powerset_uint16_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint16_Box_affine_preimage :
  pointset_powerset_uint16_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint16_Box_bounded_affine_image :
  pointset_powerset_uint16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint16_Box_bounded_affine_preimage :
  pointset_powerset_uint16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint16_Box_generalized_affine_image :
  pointset_powerset_uint16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint16_Box_generalized_affine_preimage :
  pointset_powerset_uint16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint16_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_uint16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint16_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_uint16_box ->
  linear_expression ->
```

```
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint16_Box_add_space_dimensions_and_embed :
  pointset_powerset_uint16_box -> int -> unit
val ppl_Pointset_Powerset_Uint16_Box_add_space_dimensions_and_project :
  pointset_powerset_uint16_box -> int -> unit
val ppl_Pointset_Powerset_Uint16_Box_remove_space_dimensions :
  pointset_powerset_uint16_box -> int list -> unit
val ppl_Pointset_Powerset_Uint16_Box_remove_higher_space_dimensions :
  pointset_powerset_uint16_box -> int -> unit
val ppl_Pointset_Powerset_Uint16_Box_expand_space_dimension :
  pointset_powerset_uint16_box -> int -> int -> unit
val ppl_Pointset_Powerset_Uint16_Box_fold_space_dimensions :
  pointset_powerset_uint16_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Uint16_Box_map_space_dimensions :
  pointset_powerset_uint16_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Uint16_Box_drop_some_non_integer_points :
  pointset_powerset_uint16_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint16_Box_drop_some_non_integer_points_2 :
  pointset_powerset_uint16_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint16_Box_ascii_dump :
  pointset_powerset_uint16_box -> string
val ppl_Pointset_Powerset_Uint16_Box_external_memory_in_bytes :
  pointset_powerset_uint16_box -> int
val ppl_Pointset_Powerset_Uint16_Box_total_memory_in_bytes :
  pointset_powerset_uint16_box -> int
val ppl_Pointset_Powerset_Uint16_Box_size :
  pointset_powerset_uint16_box -> int
type pointset_powerset_uint16_box_iterator
val ppl_new_Pointset_Powerset_Uint16_Box_iterator_from_iterator :
  pointset_powerset_uint16_box_iterator ->
  pointset_powerset_uint16_box_iterator
val ppl_Pointset_Powerset_Uint16_Box_begin_iterator :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box_iterator
val ppl_Pointset_Powerset_Uint16_Box_end_iterator :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box_iterator
val ppl_Pointset_Powerset_Uint16_Box_iterator_equals_iterator :
  pointset_powerset_uint16_box_iterator ->
  pointset_powerset_uint16_box_iterator -> bool
val ppl_Pointset_Powerset_Uint16_Box_increment_iterator :
  pointset_powerset_uint16_box_iterator -> unit
val ppl_Pointset_Powerset_Uint16_Box_decrement_iterator :
  pointset_powerset_uint16_box_iterator -> unit
val ppl_Pointset_Powerset_Uint16_Box_get_disjunct :
  pointset_powerset_uint16_box_iterator -> uint16_box
val ppl_Pointset_Powerset_Uint16_Box_add_disjunct :
  pointset_powerset_uint16_box -> uint16_box -> unit
```

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val ppl_Pointset_Powerset_Uint16_Box_drop_disjunct :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box_iterator -> unit
val ppl_Pointset_Powerset_Uint16_Box_drop_disjuncts :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box_iterator ->
  pointset_powerset_uint16_box_iterator -> unit
val ppl_new_Pointset_Powerset_Uint32_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_uint32_box
val ppl_new_Pointset_Powerset_Uint32_Box_from_Pointset_Powerset_Uint32_Box :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box
val ppl_new_Pointset_Powerset_Uint32_Box_from_Uint32_Box :
  uint32_box -> pointset_powerset_uint32_box
val ppl_new_Pointset_Powerset_Uint32_Box_from_Pointset_Powerset_Uint32_Box_with_compl
  pointset_powerset_uint32_box ->
  complexity_class -> pointset_powerset_uint32_box
val ppl_new_Pointset_Powerset_Uint32_Box_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> pointset_powerset_uint32_box
val ppl_new_Pointset_Powerset_Uint32_Box_from_constraints :
  constraint_system -> pointset_powerset_uint32_box
val ppl_new_Pointset_Powerset_Uint32_Box_from_congruences :
  congruence_system -> pointset_powerset_uint32_box
val ppl_Pointset_Powerset_Uint32_Box_swap :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_space_dimension :
  pointset_powerset_uint32_box -> int
val ppl_Pointset_Powerset_Uint32_Box_affine_dimension :
  pointset_powerset_uint32_box -> int
val ppl_Pointset_Powerset_Uint32_Box_relation_with_constraint :
  pointset_powerset_uint32_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Uint32_Box_relation_with_generator :
  pointset_powerset_uint32_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Uint32_Box_relation_with_congruence :
  pointset_powerset_uint32_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Uint32_Box_is_empty :
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_is_universe :
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_is_bounded :
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_contains_integer_point :
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_is_topologically_closed :
```

```
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_is_discrete :
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_topological_closure_assign :
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_pairwise_reduce :
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_omega_reduce :
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_bounds_from_above :
  pointset_powerset_uint32_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint32_Box_bounds_from_below :
  pointset_powerset_uint32_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint32_Box_maximize :
  pointset_powerset_uint32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint32_Box_minimize :
  pointset_powerset_uint32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint32_Box_maximize_with_point :
  pointset_powerset_uint32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint32_Box_minimize_with_point :
  pointset_powerset_uint32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint32_Box_contains_Pointset_Powerset_Uint32_Box :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_strictly_contains_Pointset_Powerset_Uint32_Box :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_is_disjoint_from_Pointset_Powerset_Uint32_Box :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_geometrically_covers_Pointset_Powerset_Uint32_Bo
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_geometrically_equals_Pointset_Powerset_Uint32_Bo
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_equals_Pointset_Powerset_Uint32_Box :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_OK :
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_add_constraint :
  pointset_powerset_uint32_box -> linear_constraint -> unit
```

```
val ppl_Pointset_Powerset_Uint32_Box_add_congruence :
  pointset_powerset_uint32_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint32_Box_add_constraints :
  pointset_powerset_uint32_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint32_Box_add_congruences :
  pointset_powerset_uint32_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint32_Box_refine_with_constraint :
  pointset_powerset_uint32_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint32_Box_refine_with_congruence :
  pointset_powerset_uint32_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint32_Box_refine_with_constraints :
  pointset_powerset_uint32_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint32_Box_refine_with_congruences :
  pointset_powerset_uint32_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint32_Box_intersection_assign :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_upper_bound_assign :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_difference_assign :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_concatenate_assign :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_time_elapse_assign :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_upper_bound_assign_if_exact :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_simplify_using_context_assign :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_constrains :
  pointset_powerset_uint32_box -> int -> bool
val ppl_Pointset_Powerset_Uint32_Box_unconstrain_space_dimension :
  pointset_powerset_uint32_box -> int -> unit
val ppl_Pointset_Powerset_Uint32_Box_unconstrain_space_dimensions :
  pointset_powerset_uint32_box -> int list -> unit
val ppl_Pointset_Powerset_Uint32_Box_affine_image :
  pointset_powerset_uint32_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint32_Box_affine_preimage :
  pointset_powerset_uint32_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint32_Box_bounded_affine_image :
  pointset_powerset_uint32_box ->
```

```
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint32_Box_bounded_affine_preimage :
  pointset_powerset_uint32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint32_Box_generalized_affine_image :
  pointset_powerset_uint32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint32_Box_generalized_affine_preimage :
  pointset_powerset_uint32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint32_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_uint32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint32_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_uint32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint32_Box_add_space_dimensions_and_embed :
  pointset_powerset_uint32_box -> int -> unit
val ppl_Pointset_Powerset_Uint32_Box_add_space_dimensions_and_project :
  pointset_powerset_uint32_box -> int -> unit
val ppl_Pointset_Powerset_Uint32_Box_remove_space_dimensions :
  pointset_powerset_uint32_box -> int list -> unit
val ppl_Pointset_Powerset_Uint32_Box_remove_higher_space_dimensions :
  pointset_powerset_uint32_box -> int -> unit
val ppl_Pointset_Powerset_Uint32_Box_expand_space_dimension :
  pointset_powerset_uint32_box -> int -> int -> unit
val ppl_Pointset_Powerset_Uint32_Box_fold_space_dimensions :
  pointset_powerset_uint32_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Uint32_Box_map_space_dimensions :
  pointset_powerset_uint32_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Uint32_Box_drop_some_non_integer_points :
  pointset_powerset_uint32_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint32_Box_drop_some_non_integer_points_2 :
  pointset_powerset_uint32_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint32_Box_ascii_dump :
  pointset_powerset_uint32_box -> string
val ppl_Pointset_Powerset_Uint32_Box_external_memory_in_bytes :
  pointset_powerset_uint32_box -> int
val ppl_Pointset_Powerset_Uint32_Box_total_memory_in_bytes :
  pointset_powerset_uint32_box -> int
val ppl_Pointset_Powerset_Uint32_Box_size :
  pointset_powerset_uint32_box -> int
```

```
type pointset_powerset_uint32_box_iterator
val ppl_new_Pointset_Powerset_Uint32_Box_iterator_from_iterator :
  pointset_powerset_uint32_box_iterator ->
  pointset_powerset_uint32_box_iterator
val ppl_Pointset_Powerset_Uint32_Box_begin_iterator :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box_iterator
val ppl_Pointset_Powerset_Uint32_Box_end_iterator :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box_iterator
val ppl_Pointset_Powerset_Uint32_Box_iterator_equals_iterator :
  pointset_powerset_uint32_box_iterator ->
  pointset_powerset_uint32_box_iterator -> bool
val ppl_Pointset_Powerset_Uint32_Box_increment_iterator :
  pointset_powerset_uint32_box_iterator -> unit
val ppl_Pointset_Powerset_Uint32_Box_decrement_iterator :
  pointset_powerset_uint32_box_iterator -> unit
val ppl_Pointset_Powerset_Uint32_Box_get_disjunct :
  pointset_powerset_uint32_box_iterator -> uint32_box
val ppl_Pointset_Powerset_Uint32_Box_add_disjunct :
  pointset_powerset_uint32_box -> uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_drop_disjunct :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box_iterator -> unit
val ppl_Pointset_Powerset_Uint32_Box_drop_disjuncts :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box_iterator ->
  pointset_powerset_uint32_box_iterator -> unit
val ppl_new_Pointset_Powerset_Uint64_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_uint64_box
val ppl_new_Pointset_Powerset_Uint64_Box_from_Pointset_Powerset_Uint64_Box :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box
val ppl_new_Pointset_Powerset_Uint64_Box_from_Uint64_Box :
  uint64_box -> pointset_powerset_uint64_box
val ppl_new_Pointset_Powerset_Uint64_Box_from_Pointset_Powerset_Uint64_Box_with_compl
  pointset_powerset_uint64_box ->
  complexity_class -> pointset_powerset_uint64_box
val ppl_new_Pointset_Powerset_Uint64_Box_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> pointset_powerset_uint64_box
val ppl_new_Pointset_Powerset_Uint64_Box_from_constraints :
  constraint_system -> pointset_powerset_uint64_box
val ppl_new_Pointset_Powerset_Uint64_Box_from_congruences :
  congruence_system -> pointset_powerset_uint64_box
val ppl_Pointset_Powerset_Uint64_Box_swap :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_space_dimension :
```

```
  pointset_powerset_uint64_box -> int
val ppl_Pointset_Powerset_Uint64_Box_affine_dimension :
  pointset_powerset_uint64_box -> int
val ppl_Pointset_Powerset_Uint64_Box_relation_with_constraint :
  pointset_powerset_uint64_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Uint64_Box_relation_with_generator :
  pointset_powerset_uint64_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Uint64_Box_relation_with_congruence :
  pointset_powerset_uint64_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Uint64_Box_is_empty :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_is_universe :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_is_bounded :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_contains_integer_point :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_is_topologically_closed :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_is_discrete :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_topological_closure_assign :
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_pairwise_reduce :
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_omega_reduce :
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_bounds_from_above :
  pointset_powerset_uint64_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint64_Box_bounds_from_below :
  pointset_powerset_uint64_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint64_Box_maximize :
  pointset_powerset_uint64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint64_Box_minimize :
  pointset_powerset_uint64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint64_Box_maximize_with_point :
  pointset_powerset_uint64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint64_Box_minimize_with_point :
  pointset_powerset_uint64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint64_Box_contains_Pointset_Powerset_Uint64_Box :
```

```
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_strictly_contains_Pointset_Powerset_Uint64_Box :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_is_disjoint_from_Pointset_Powerset_Uint64_Box :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_geometrically_covers_Pointset_Powerset_Uint64_Bo
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_geometrically_equals_Pointset_Powerset_Uint64_Bo
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_equals_Pointset_Powerset_Uint64_Box :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_OK :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_add_constraint :
  pointset_powerset_uint64_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint64_Box_add_congruence :
  pointset_powerset_uint64_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint64_Box_add_constraints :
  pointset_powerset_uint64_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint64_Box_add_congruences :
  pointset_powerset_uint64_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint64_Box_refine_with_constraint :
  pointset_powerset_uint64_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint64_Box_refine_with_congruence :
  pointset_powerset_uint64_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint64_Box_refine_with_constraints :
  pointset_powerset_uint64_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint64_Box_refine_with_congruences :
  pointset_powerset_uint64_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint64_Box_intersection_assign :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_upper_bound_assign :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_difference_assign :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_concatenate_assign :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_time_elapse_assign :
  pointset_powerset_uint64_box ->
```

```
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_upper_bound_assign_if_exact :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_simplify_using_context_assign :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_constrains :
  pointset_powerset_uint64_box -> int -> bool
val ppl_Pointset_Powerset_Uint64_Box_unconstrain_space_dimension :
  pointset_powerset_uint64_box -> int -> unit
val ppl_Pointset_Powerset_Uint64_Box_unconstrain_space_dimensions :
  pointset_powerset_uint64_box -> int list -> unit
val ppl_Pointset_Powerset_Uint64_Box_affine_image :
  pointset_powerset_uint64_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint64_Box_affine_preimage :
  pointset_powerset_uint64_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint64_Box_bounded_affine_image :
  pointset_powerset_uint64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint64_Box_bounded_affine_preimage :
  pointset_powerset_uint64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint64_Box_generalized_affine_image :
  pointset_powerset_uint64_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint64_Box_generalized_affine_preimage :
  pointset_powerset_uint64_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint64_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_uint64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint64_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_uint64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint64_Box_add_space_dimensions_and_embed :
  pointset_powerset_uint64_box -> int -> unit
val ppl_Pointset_Powerset_Uint64_Box_add_space_dimensions_and_project :
  pointset_powerset_uint64_box -> int -> unit
val ppl_Pointset_Powerset_Uint64_Box_remove_space_dimensions :
  pointset_powerset_uint64_box -> int list -> unit
val ppl_Pointset_Powerset_Uint64_Box_remove_higher_space_dimensions :
```

```
  pointset_powerset_uint64_box -> int -> unit
val ppl_Pointset_Powerset_Uint64_Box_expand_space_dimension :
  pointset_powerset_uint64_box -> int -> int -> unit
val ppl_Pointset_Powerset_Uint64_Box_fold_space_dimensions :
  pointset_powerset_uint64_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Uint64_Box_map_space_dimensions :
  pointset_powerset_uint64_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Uint64_Box_drop_some_non_integer_points :
  pointset_powerset_uint64_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint64_Box_drop_some_non_integer_points_2 :
  pointset_powerset_uint64_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint64_Box_ascii_dump :
  pointset_powerset_uint64_box -> string
val ppl_Pointset_Powerset_Uint64_Box_external_memory_in_bytes :
  pointset_powerset_uint64_box -> int
val ppl_Pointset_Powerset_Uint64_Box_total_memory_in_bytes :
  pointset_powerset_uint64_box -> int
val ppl_Pointset_Powerset_Uint64_Box_size :
  pointset_powerset_uint64_box -> int
type pointset_powerset_uint64_box_iterator
val ppl_new_Pointset_Powerset_Uint64_Box_iterator_from_iterator :
  pointset_powerset_uint64_box_iterator ->
  pointset_powerset_uint64_box_iterator
val ppl_Pointset_Powerset_Uint64_Box_begin_iterator :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box_iterator
val ppl_Pointset_Powerset_Uint64_Box_end_iterator :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box_iterator
val ppl_Pointset_Powerset_Uint64_Box_iterator_equals_iterator :
  pointset_powerset_uint64_box_iterator ->
  pointset_powerset_uint64_box_iterator -> bool
val ppl_Pointset_Powerset_Uint64_Box_increment_iterator :
  pointset_powerset_uint64_box_iterator -> unit
val ppl_Pointset_Powerset_Uint64_Box_decrement_iterator :
  pointset_powerset_uint64_box_iterator -> unit
val ppl_Pointset_Powerset_Uint64_Box_get_disjunct :
  pointset_powerset_uint64_box_iterator -> uint64_box
val ppl_Pointset_Powerset_Uint64_Box_add_disjunct :
  pointset_powerset_uint64_box -> uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_drop_disjunct :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box_iterator -> unit
val ppl_Pointset_Powerset_Uint64_Box_drop_disjuncts :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box_iterator ->
  pointset_powerset_uint64_box_iterator -> unit
val ppl_new_Pointset_Powerset_Rational_Box_from_space_dimension :
```

```
  int ->
  degenerate_element -> pointset_powerset_rational_box
val ppl_new_Pointset_Powerset_Rational_Box_from_Pointset_Powerset_Rational_Box :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box
val ppl_new_Pointset_Powerset_Rational_Box_from_Rational_Box :
  rational_box -> pointset_powerset_rational_box
val ppl_new_Pointset_Powerset_Rational_Box_from_Pointset_Powerset_Rational_Box_with_c
  pointset_powerset_rational_box ->
  complexity_class -> pointset_powerset_rational_box
val ppl_new_Pointset_Powerset_Rational_Box_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> pointset_powerset_rational_box
val ppl_new_Pointset_Powerset_Rational_Box_from_constraints :
  constraint_system -> pointset_powerset_rational_box
val ppl_new_Pointset_Powerset_Rational_Box_from_congruences :
  congruence_system -> pointset_powerset_rational_box
val ppl_Pointset_Powerset_Rational_Box_swap :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_space_dimension :
  pointset_powerset_rational_box -> int
val ppl_Pointset_Powerset_Rational_Box_affine_dimension :
  pointset_powerset_rational_box -> int
val ppl_Pointset_Powerset_Rational_Box_relation_with_constraint :
  pointset_powerset_rational_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Rational_Box_relation_with_generator :
  pointset_powerset_rational_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Rational_Box_relation_with_congruence :
  pointset_powerset_rational_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Rational_Box_is_empty :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_is_universe :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_is_bounded :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_contains_integer_point :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_is_topologically_closed :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_is_discrete :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_topological_closure_assign :
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_pairwise_reduce :
  pointset_powerset_rational_box -> unit
```

```
val ppl_Pointset_Powerset_Rational_Box_omega_reduce :
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_bounds_from_above :
  pointset_powerset_rational_box ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Rational_Box_bounds_from_below :
  pointset_powerset_rational_box ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Rational_Box_maximize :
  pointset_powerset_rational_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Rational_Box_minimize :
  pointset_powerset_rational_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Rational_Box_maximize_with_point :
  pointset_powerset_rational_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Rational_Box_minimize_with_point :
  pointset_powerset_rational_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Rational_Box_contains_Pointset_Powerset_Rational_Box :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_strictly_contains_Pointset_Powerset_Rational_B
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_is_disjoint_from_Pointset_Powerset_Rational_Bo
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_geometrically_covers_Pointset_Powerset_Rationa
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_geometrically_equals_Pointset_Powerset_Rationa
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_equals_Pointset_Powerset_Rational_Box :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_OK :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_add_constraint :
  pointset_powerset_rational_box ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Rational_Box_add_congruence :
  pointset_powerset_rational_box ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Rational_Box_add_constraints :
  pointset_powerset_rational_box ->
```

```
  constraint_system -> unit
val ppl_Pointset_Powerset_Rational_Box_add_congruences :
  pointset_powerset_rational_box ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Rational_Box_refine_with_constraint :
  pointset_powerset_rational_box ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Rational_Box_refine_with_congruence :
  pointset_powerset_rational_box ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Rational_Box_refine_with_constraints :
  pointset_powerset_rational_box ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Rational_Box_refine_with_congruences :
  pointset_powerset_rational_box ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Rational_Box_intersection_assign :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_upper_bound_assign :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_difference_assign :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_concatenate_assign :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_time_elapse_assign :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_upper_bound_assign_if_exact :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_simplify_using_context_assign :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_constrains :
  pointset_powerset_rational_box -> int -> bool
val ppl_Pointset_Powerset_Rational_Box_unconstrain_space_dimension :
  pointset_powerset_rational_box -> int -> unit
val ppl_Pointset_Powerset_Rational_Box_unconstrain_space_dimensions :
  pointset_powerset_rational_box -> int list -> unit
val ppl_Pointset_Powerset_Rational_Box_affine_image :
  pointset_powerset_rational_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Rational_Box_affine_preimage :
  pointset_powerset_rational_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Rational_Box_bounded_affine_image :
```

```
  pointset_powerset_rational_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Rational_Box_bounded_affine_preimage :
  pointset_powerset_rational_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Rational_Box_generalized_affine_image :
  pointset_powerset_rational_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Rational_Box_generalized_affine_preimage :
  pointset_powerset_rational_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Rational_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_rational_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Rational_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_rational_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Rational_Box_add_space_dimensions_and_embed :
  pointset_powerset_rational_box -> int -> unit
val ppl_Pointset_Powerset_Rational_Box_add_space_dimensions_and_project :
  pointset_powerset_rational_box -> int -> unit
val ppl_Pointset_Powerset_Rational_Box_remove_space_dimensions :
  pointset_powerset_rational_box -> int list -> unit
val ppl_Pointset_Powerset_Rational_Box_remove_higher_space_dimensions :
  pointset_powerset_rational_box -> int -> unit
val ppl_Pointset_Powerset_Rational_Box_expand_space_dimension :
  pointset_powerset_rational_box -> int -> int -> unit
val ppl_Pointset_Powerset_Rational_Box_fold_space_dimensions :
  pointset_powerset_rational_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Rational_Box_map_space_dimensions :
  pointset_powerset_rational_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Rational_Box_drop_some_non_integer_points :
  pointset_powerset_rational_box ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Rational_Box_drop_some_non_integer_points_2 :
  pointset_powerset_rational_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Rational_Box_ascii_dump :
  pointset_powerset_rational_box -> string
val ppl_Pointset_Powerset_Rational_Box_external_memory_in_bytes :
  pointset_powerset_rational_box -> int
val ppl_Pointset_Powerset_Rational_Box_total_memory_in_bytes :
  pointset_powerset_rational_box -> int
val ppl_Pointset_Powerset_Rational_Box_size :
```

```
  pointset_powerset_rational_box -> int
type pointset_powerset_rational_box_iterator
val ppl_new_Pointset_Powerset_Rational_Box_iterator_from_iterator :
  pointset_powerset_rational_box_iterator ->
  pointset_powerset_rational_box_iterator
val ppl_Pointset_Powerset_Rational_Box_begin_iterator :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box_iterator
val ppl_Pointset_Powerset_Rational_Box_end_iterator :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box_iterator
val ppl_Pointset_Powerset_Rational_Box_iterator_equals_iterator :
  pointset_powerset_rational_box_iterator ->
  pointset_powerset_rational_box_iterator -> bool
val ppl_Pointset_Powerset_Rational_Box_increment_iterator :
  pointset_powerset_rational_box_iterator -> unit
val ppl_Pointset_Powerset_Rational_Box_decrement_iterator :
  pointset_powerset_rational_box_iterator -> unit
val ppl_Pointset_Powerset_Rational_Box_get_disjunct :
  pointset_powerset_rational_box_iterator -> rational_box
val ppl_Pointset_Powerset_Rational_Box_add_disjunct :
  pointset_powerset_rational_box -> rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_drop_disjunct :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box_iterator -> unit
val ppl_Pointset_Powerset_Rational_Box_drop_disjuncts :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box_iterator ->
  pointset_powerset_rational_box_iterator -> unit
val ppl_new_Pointset_Powerset_Z_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_z_box
val ppl_new_Pointset_Powerset_Z_Box_from_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box -> pointset_powerset_z_box
val ppl_new_Pointset_Powerset_Z_Box_from_Z_Box :
  z_box -> pointset_powerset_z_box
val ppl_new_Pointset_Powerset_Z_Box_from_Pointset_Powerset_Z_Box_with_complexity :
  pointset_powerset_z_box ->
  complexity_class -> pointset_powerset_z_box
val ppl_new_Pointset_Powerset_Z_Box_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> pointset_powerset_z_box
val ppl_new_Pointset_Powerset_Z_Box_from_constraints :
  constraint_system -> pointset_powerset_z_box
val ppl_new_Pointset_Powerset_Z_Box_from_congruences :
  congruence_system -> pointset_powerset_z_box
val ppl_Pointset_Powerset_Z_Box_swap :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_space_dimension :
```

```
  pointset_powerset_z_box -> int
val ppl_Pointset_Powerset_Z_Box_affine_dimension :
  pointset_powerset_z_box -> int
val ppl_Pointset_Powerset_Z_Box_relation_with_constraint :
  pointset_powerset_z_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Z_Box_relation_with_generator :
  pointset_powerset_z_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Z_Box_relation_with_congruence :
  pointset_powerset_z_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Z_Box_is_empty : pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_is_universe : pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_is_bounded : pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_contains_integer_point :
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_is_topologically_closed :
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_is_discrete : pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_topological_closure_assign :
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_pairwise_reduce :
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_omega_reduce :
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_bounds_from_above :
  pointset_powerset_z_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Z_Box_bounds_from_below :
  pointset_powerset_z_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Z_Box_maximize :
  pointset_powerset_z_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Z_Box_minimize :
  pointset_powerset_z_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Z_Box_maximize_with_point :
  pointset_powerset_z_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Z_Box_minimize_with_point :
  pointset_powerset_z_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Z_Box_contains_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_strictly_contains_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box ->
```

```
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_is_disjoint_from_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_geometrically_covers_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_geometrically_equals_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_equals_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_OK : pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_add_constraint :
  pointset_powerset_z_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Z_Box_add_congruence :
  pointset_powerset_z_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Z_Box_add_constraints :
  pointset_powerset_z_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Z_Box_add_congruences :
  pointset_powerset_z_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Z_Box_refine_with_constraint :
  pointset_powerset_z_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Z_Box_refine_with_congruence :
  pointset_powerset_z_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Z_Box_refine_with_constraints :
  pointset_powerset_z_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Z_Box_refine_with_congruences :
  pointset_powerset_z_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Z_Box_intersection_assign :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_upper_bound_assign :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_difference_assign :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_concatenate_assign :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_time_elapse_assign :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_upper_bound_assign_if_exact :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_simplify_using_context_assign :
```

```
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_constrains :
  pointset_powerset_z_box -> int -> bool
val ppl_Pointset_Powerset_Z_Box_unconstrain_space_dimension :
  pointset_powerset_z_box -> int -> unit
val ppl_Pointset_Powerset_Z_Box_unconstrain_space_dimensions :
  pointset_powerset_z_box -> int list -> unit
val ppl_Pointset_Powerset_Z_Box_affine_image :
  pointset_powerset_z_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Z_Box_affine_preimage :
  pointset_powerset_z_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Z_Box_bounded_affine_image :
  pointset_powerset_z_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Z_Box_bounded_affine_preimage :
  pointset_powerset_z_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Z_Box_generalized_affine_image :
  pointset_powerset_z_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Z_Box_generalized_affine_preimage :
  pointset_powerset_z_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Z_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_z_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Z_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_z_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Z_Box_add_space_dimensions_and_embed :
  pointset_powerset_z_box -> int -> unit
val ppl_Pointset_Powerset_Z_Box_add_space_dimensions_and_project :
  pointset_powerset_z_box -> int -> unit
val ppl_Pointset_Powerset_Z_Box_remove_space_dimensions :
  pointset_powerset_z_box -> int list -> unit
val ppl_Pointset_Powerset_Z_Box_remove_higher_space_dimensions :
  pointset_powerset_z_box -> int -> unit
val ppl_Pointset_Powerset_Z_Box_expand_space_dimension :
  pointset_powerset_z_box -> int -> int -> unit
val ppl_Pointset_Powerset_Z_Box_fold_space_dimensions :
  pointset_powerset_z_box -> int list -> int -> unit
```

```
val ppl_Pointset_Powerset_Z_Box_map_space_dimensions :
  pointset_powerset_z_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Z_Box_drop_some_non_integer_points :
  pointset_powerset_z_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Z_Box_drop_some_non_integer_points_2 :
  pointset_powerset_z_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Z_Box_ascii_dump :
  pointset_powerset_z_box -> string
val ppl_Pointset_Powerset_Z_Box_external_memory_in_bytes :
  pointset_powerset_z_box -> int
val ppl_Pointset_Powerset_Z_Box_total_memory_in_bytes :
  pointset_powerset_z_box -> int
val ppl_Pointset_Powerset_Z_Box_size : pointset_powerset_z_box -> int
type pointset_powerset_z_box_iterator
val ppl_new_Pointset_Powerset_Z_Box_iterator_from_iterator :
  pointset_powerset_z_box_iterator ->
  pointset_powerset_z_box_iterator
val ppl_Pointset_Powerset_Z_Box_begin_iterator :
  pointset_powerset_z_box ->
  pointset_powerset_z_box_iterator
val ppl_Pointset_Powerset_Z_Box_end_iterator :
  pointset_powerset_z_box ->
  pointset_powerset_z_box_iterator
val ppl_Pointset_Powerset_Z_Box_iterator_equals_iterator :
  pointset_powerset_z_box_iterator ->
  pointset_powerset_z_box_iterator -> bool
val ppl_Pointset_Powerset_Z_Box_increment_iterator :
  pointset_powerset_z_box_iterator -> unit
val ppl_Pointset_Powerset_Z_Box_decrement_iterator :
  pointset_powerset_z_box_iterator -> unit
val ppl_Pointset_Powerset_Z_Box_get_disjunct :
  pointset_powerset_z_box_iterator -> z_box
val ppl_Pointset_Powerset_Z_Box_add_disjunct :
  pointset_powerset_z_box -> z_box -> unit
val ppl_Pointset_Powerset_Z_Box_drop_disjunct :
  pointset_powerset_z_box ->
  pointset_powerset_z_box_iterator -> unit
val ppl_Pointset_Powerset_Z_Box_drop_disjuncts :
  pointset_powerset_z_box ->
  pointset_powerset_z_box_iterator ->
  pointset_powerset_z_box_iterator -> unit
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_bd_shape_int8_t
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_Pointset_Powerset_BD_Shape_int8_t
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_BD_Shape_int8_t :
```

```
  bd_shape_int8_t -> pointset_powerset_bd_shape_int8_t
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_Pointset_Powerset_BD_Shape_int8_t_
  pointset_powerset_bd_shape_int8_t ->
  complexity_class -> pointset_powerset_bd_shape_int8_t
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> pointset_powerset_bd_shape_int8_t
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_int8_t
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_int8_t
val ppl_Pointset_Powerset_BD_Shape_int8_t_swap :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_space_dimension :
  pointset_powerset_bd_shape_int8_t -> int
val ppl_Pointset_Powerset_BD_Shape_int8_t_affine_dimension :
  pointset_powerset_bd_shape_int8_t -> int
val ppl_Pointset_Powerset_BD_Shape_int8_t_relation_with_constraint :
  pointset_powerset_bd_shape_int8_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int8_t_relation_with_generator :
  pointset_powerset_bd_shape_int8_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_int8_t_relation_with_congruence :
  pointset_powerset_bd_shape_int8_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int8_t_is_empty :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_is_universe :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_is_bounded :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_contains_integer_point :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_is_topologically_closed :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_is_discrete :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_topological_closure_assign :
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_pairwise_reduce :
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_omega_reduce :
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_bounds_from_above :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_bounds_from_below :
```

```
  pointset_powerset_bd_shape_int8_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_maximize :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_minimize :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_maximize_with_point :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int8_t_minimize_with_point :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int8_t_contains_Pointset_Powerset_BD_Shape_int8_t
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_strictly_contains_Pointset_Powerset_BD_Shap
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_is_disjoint_from_Pointset_Powerset_BD_Shape
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_geometrically_covers_Pointset_Powerset_BD_S
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_geometrically_equals_Pointset_Powerset_BD_S
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_equals_Pointset_Powerset_BD_Shape_int8_t :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_OK :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_constraint :
  pointset_powerset_bd_shape_int8_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_congruence :
  pointset_powerset_bd_shape_int8_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_constraints :
  pointset_powerset_bd_shape_int8_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_congruences :
  pointset_powerset_bd_shape_int8_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_refine_with_constraint :
  pointset_powerset_bd_shape_int8_t ->
```

```
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_refine_with_congruence :
  pointset_powerset_bd_shape_int8_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_refine_with_constraints :
  pointset_powerset_bd_shape_int8_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_refine_with_congruences :
  pointset_powerset_bd_shape_int8_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_intersection_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_upper_bound_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_difference_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_concatenate_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_time_elapse_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_simplify_using_context_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_constrains :
  pointset_powerset_bd_shape_int8_t -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_unconstrain_space_dimension :
  pointset_powerset_bd_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_int8_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_affine_image :
  pointset_powerset_bd_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_affine_preimage :
  pointset_powerset_bd_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_bounded_affine_image :
  pointset_powerset_bd_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_bounded_affine_preimage :
  pointset_powerset_bd_shape_int8_t ->
  int ->
```

```
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_generalized_affine_image :
  pointset_powerset_bd_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_generalized_affine_preimage :
  pointset_powerset_bd_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_remove_space_dimensions :
  pointset_powerset_bd_shape_int8_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_expand_space_dimension :
  pointset_powerset_bd_shape_int8_t -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_fold_space_dimensions :
  pointset_powerset_bd_shape_int8_t -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_map_space_dimensions :
  pointset_powerset_bd_shape_int8_t -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_drop_some_non_integer_points :
  pointset_powerset_bd_shape_int8_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_int8_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_ascii_dump :
  pointset_powerset_bd_shape_int8_t -> string
val ppl_Pointset_Powerset_BD_Shape_int8_t_external_memory_in_bytes :
  pointset_powerset_bd_shape_int8_t -> int
val ppl_Pointset_Powerset_BD_Shape_int8_t_total_memory_in_bytes :
  pointset_powerset_bd_shape_int8_t -> int
val ppl_Pointset_Powerset_BD_Shape_int8_t_size :
  pointset_powerset_bd_shape_int8_t -> int
type pointset_powerset_bd_shape_int8_t_iterator
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_iterator_from_iterator :
  pointset_powerset_bd_shape_int8_t_iterator ->
  pointset_powerset_bd_shape_int8_t_iterator
```

```
val ppl_Pointset_Powerset_BD_Shape_int8_t_begin_iterator :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int8_t_end_iterator :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int8_t_iterator_equals_iterator :
  pointset_powerset_bd_shape_int8_t_iterator ->
  pointset_powerset_bd_shape_int8_t_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_increment_iterator :
  pointset_powerset_bd_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_decrement_iterator :
  pointset_powerset_bd_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_get_disjunct :
  pointset_powerset_bd_shape_int8_t_iterator ->
  bd_shape_int8_t
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_disjunct :
  pointset_powerset_bd_shape_int8_t ->
  bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_drop_disjunct :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_drop_disjuncts :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t_iterator ->
  pointset_powerset_bd_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> int -> unit
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_bd_shape_int16_t
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_Pointset_Powerset_BD_Shape_int16_
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> pointset_powerset_bd_shape_int16_t
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_Pointset_Powerset_BD_Shape_int16_
  pointset_powerset_bd_shape_int16_t ->
  complexity_class -> pointset_powerset_bd_shape_int16_t
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_BD_Shape_int16_t_with_complexity
```

```
  bd_shape_int16_t ->
  complexity_class -> pointset_powerset_bd_shape_int16_t
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_int16_t
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_int16_t
val ppl_Pointset_Powerset_BD_Shape_int16_t_swap :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_space_dimension :
  pointset_powerset_bd_shape_int16_t -> int
val ppl_Pointset_Powerset_BD_Shape_int16_t_affine_dimension :
  pointset_powerset_bd_shape_int16_t -> int
val ppl_Pointset_Powerset_BD_Shape_int16_t_relation_with_constraint :
  pointset_powerset_bd_shape_int16_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int16_t_relation_with_generator :
  pointset_powerset_bd_shape_int16_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_int16_t_relation_with_congruence :
  pointset_powerset_bd_shape_int16_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int16_t_is_empty :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_is_universe :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_is_bounded :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_contains_integer_point :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_is_topologically_closed :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_is_discrete :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_topological_closure_assign :
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_pairwise_reduce :
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_omega_reduce :
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_bounds_from_above :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_bounds_from_below :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_maximize :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
```

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val ppl_Pointset_Powerset_BD_Shape_int16_t_minimize :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_maximize_with_point :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int16_t_minimize_with_point :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int16_t_contains_Pointset_Powerset_BD_Shape_int16_
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_strictly_contains_Pointset_Powerset_BD_Sha
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_is_disjoint_from_Pointset_Powerset_BD_Shap
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_geometrically_covers_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_geometrically_equals_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_equals_Pointset_Powerset_BD_Shape_int16_t
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_OK :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_constraint :
  pointset_powerset_bd_shape_int16_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_congruence :
  pointset_powerset_bd_shape_int16_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_constraints :
  pointset_powerset_bd_shape_int16_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_congruences :
  pointset_powerset_bd_shape_int16_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_refine_with_constraint :
  pointset_powerset_bd_shape_int16_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_refine_with_congruence :
  pointset_powerset_bd_shape_int16_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_refine_with_constraints :
```

```
  pointset_powerset_bd_shape_int16_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_refine_with_congruences :
  pointset_powerset_bd_shape_int16_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_intersection_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_upper_bound_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_difference_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_concatenate_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_time_elapse_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_simplify_using_context_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_constrains :
  pointset_powerset_bd_shape_int16_t -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_unconstrain_space_dimension :
  pointset_powerset_bd_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_int16_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_affine_image :
  pointset_powerset_bd_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_affine_preimage :
  pointset_powerset_bd_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_bounded_affine_image :
  pointset_powerset_bd_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_bounded_affine_preimage :
  pointset_powerset_bd_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_generalized_affine_image :
  pointset_powerset_bd_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
```

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val ppl_Pointset_Powerset_BD_Shape_int16_t_generalized_affine_preimage :
  pointset_powerset_bd_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_remove_space_dimensions :
  pointset_powerset_bd_shape_int16_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_expand_space_dimension :
  pointset_powerset_bd_shape_int16_t -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_fold_space_dimensions :
  pointset_powerset_bd_shape_int16_t -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_map_space_dimensions :
  pointset_powerset_bd_shape_int16_t -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_drop_some_non_integer_points :
  pointset_powerset_bd_shape_int16_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_int16_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_ascii_dump :
  pointset_powerset_bd_shape_int16_t -> string
val ppl_Pointset_Powerset_BD_Shape_int16_t_external_memory_in_bytes :
  pointset_powerset_bd_shape_int16_t -> int
val ppl_Pointset_Powerset_BD_Shape_int16_t_total_memory_in_bytes :
  pointset_powerset_bd_shape_int16_t -> int
val ppl_Pointset_Powerset_BD_Shape_int16_t_size :
  pointset_powerset_bd_shape_int16_t -> int
type pointset_powerset_bd_shape_int16_t_iterator
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_iterator_from_iterator :
  pointset_powerset_bd_shape_int16_t_iterator ->
  pointset_powerset_bd_shape_int16_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int16_t_begin_iterator :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int16_t_end_iterator :
  pointset_powerset_bd_shape_int16_t ->
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  pointset_powerset_bd_shape_int16_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int16_t_iterator_equals_iterator :
  pointset_powerset_bd_shape_int16_t_iterator ->
  pointset_powerset_bd_shape_int16_t_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_increment_iterator :
  pointset_powerset_bd_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_decrement_iterator :
  pointset_powerset_bd_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_get_disjunct :
  pointset_powerset_bd_shape_int16_t_iterator ->
  bd_shape_int16_t
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_disjunct :
  pointset_powerset_bd_shape_int16_t ->
  bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_drop_disjunct :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_drop_disjuncts :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t_iterator ->
  pointset_powerset_bd_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> int -> unit
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_bd_shape_int32_t
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_Pointset_Powerset_BD_Shape_int32_
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> pointset_powerset_bd_shape_int32_t
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_Pointset_Powerset_BD_Shape_int32_
  pointset_powerset_bd_shape_int32_t ->
  complexity_class -> pointset_powerset_bd_shape_int32_t
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_BD_Shape_int32_t_with_complexity
  bd_shape_int32_t ->
  complexity_class -> pointset_powerset_bd_shape_int32_t
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_int32_t
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_congruences :
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  congruence_system -> pointset_powerset_bd_shape_int32_t
val ppl_Pointset_Powerset_BD_Shape_int32_t_swap :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_space_dimension :
  pointset_powerset_bd_shape_int32_t -> int
val ppl_Pointset_Powerset_BD_Shape_int32_t_affine_dimension :
  pointset_powerset_bd_shape_int32_t -> int
val ppl_Pointset_Powerset_BD_Shape_int32_t_relation_with_constraint :
  pointset_powerset_bd_shape_int32_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int32_t_relation_with_generator :
  pointset_powerset_bd_shape_int32_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_int32_t_relation_with_congruence :
  pointset_powerset_bd_shape_int32_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int32_t_is_empty :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_is_universe :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_is_bounded :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_contains_integer_point :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_is_topologically_closed :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_is_discrete :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_topological_closure_assign :
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_pairwise_reduce :
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_omega_reduce :
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_bounds_from_above :
  pointset_powerset_bd_shape_int32_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_bounds_from_below :
  pointset_powerset_bd_shape_int32_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_maximize :
  pointset_powerset_bd_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_minimize :
  pointset_powerset_bd_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_maximize_with_point :
  pointset_powerset_bd_shape_int32_t ->
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  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int32_t_minimize_with_point :
  pointset_powerset_bd_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int32_t_contains_Pointset_Powerset_BD_Shape_int32_
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_strictly_contains_Pointset_Powerset_BD_Sha
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_is_disjoint_from_Pointset_Powerset_BD_Shap
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_geometrically_covers_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_geometrically_equals_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_equals_Pointset_Powerset_BD_Shape_int32_t
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_OK :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_constraint :
  pointset_powerset_bd_shape_int32_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_congruence :
  pointset_powerset_bd_shape_int32_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_constraints :
  pointset_powerset_bd_shape_int32_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_congruences :
  pointset_powerset_bd_shape_int32_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_refine_with_constraint :
  pointset_powerset_bd_shape_int32_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_refine_with_congruence :
  pointset_powerset_bd_shape_int32_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_refine_with_constraints :
  pointset_powerset_bd_shape_int32_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_refine_with_congruences :
  pointset_powerset_bd_shape_int32_t ->
  congruence_system -> unit
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val ppl_Pointset_Powerset_BD_Shape_int32_t_intersection_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_upper_bound_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_difference_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_concatenate_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_time_elapse_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_simplify_using_context_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_constrains :
  pointset_powerset_bd_shape_int32_t -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_unconstrain_space_dimension :
  pointset_powerset_bd_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_int32_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_affine_image :
  pointset_powerset_bd_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_affine_preimage :
  pointset_powerset_bd_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_bounded_affine_image :
  pointset_powerset_bd_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_bounded_affine_preimage :
  pointset_powerset_bd_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_generalized_affine_image :
  pointset_powerset_bd_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_generalized_affine_preimage :
  pointset_powerset_bd_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_generalized_affine_image_lhs_rhs :
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  pointset_powerset_bd_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_remove_space_dimensions :
  pointset_powerset_bd_shape_int32_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_expand_space_dimension :
  pointset_powerset_bd_shape_int32_t -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_fold_space_dimensions :
  pointset_powerset_bd_shape_int32_t -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_map_space_dimensions :
  pointset_powerset_bd_shape_int32_t -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_drop_some_non_integer_points :
  pointset_powerset_bd_shape_int32_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_int32_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_ascii_dump :
  pointset_powerset_bd_shape_int32_t -> string
val ppl_Pointset_Powerset_BD_Shape_int32_t_external_memory_in_bytes :
  pointset_powerset_bd_shape_int32_t -> int
val ppl_Pointset_Powerset_BD_Shape_int32_t_total_memory_in_bytes :
  pointset_powerset_bd_shape_int32_t -> int
val ppl_Pointset_Powerset_BD_Shape_int32_t_size :
  pointset_powerset_bd_shape_int32_t -> int
type pointset_powerset_bd_shape_int32_t_iterator
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_iterator_from_iterator :
  pointset_powerset_bd_shape_int32_t_iterator ->
  pointset_powerset_bd_shape_int32_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int32_t_begin_iterator :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int32_t_end_iterator :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int32_t_iterator_equals_iterator :
  pointset_powerset_bd_shape_int32_t_iterator ->
  pointset_powerset_bd_shape_int32_t_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_increment_iterator :
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  pointset_powerset_bd_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_decrement_iterator :
  pointset_powerset_bd_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_get_disjunct :
  pointset_powerset_bd_shape_int32_t_iterator ->
  bd_shape_int32_t
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_disjunct :
  pointset_powerset_bd_shape_int32_t ->
  bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_drop_disjunct :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_drop_disjuncts :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t_iterator ->
  pointset_powerset_bd_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> int -> unit
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_bd_shape_int64_t
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_Pointset_Powerset_BD_Shape_int64_
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> pointset_powerset_bd_shape_int64_t
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_Pointset_Powerset_BD_Shape_int64_
  pointset_powerset_bd_shape_int64_t ->
  complexity_class -> pointset_powerset_bd_shape_int64_t
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_BD_Shape_int64_t_with_complexity
  bd_shape_int64_t ->
  complexity_class -> pointset_powerset_bd_shape_int64_t
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_int64_t
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_int64_t
val ppl_Pointset_Powerset_BD_Shape_int64_t_swap :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_space_dimension :
```

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  pointset_powerset_bd_shape_int64_t -> int
val ppl_Pointset_Powerset_BD_Shape_int64_t_affine_dimension :
  pointset_powerset_bd_shape_int64_t -> int
val ppl_Pointset_Powerset_BD_Shape_int64_t_relation_with_constraint :
  pointset_powerset_bd_shape_int64_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int64_t_relation_with_generator :
  pointset_powerset_bd_shape_int64_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_int64_t_relation_with_congruence :
  pointset_powerset_bd_shape_int64_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int64_t_is_empty :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_is_universe :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_is_bounded :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_contains_integer_point :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_is_topologically_closed :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_is_discrete :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_topological_closure_assign :
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_pairwise_reduce :
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_omega_reduce :
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_bounds_from_above :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_bounds_from_below :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_maximize :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_minimize :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_maximize_with_point :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int64_t_minimize_with_point :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression ->
```

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  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int64_t_contains_Pointset_Powerset_BD_Shape_int64_
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_strictly_contains_Pointset_Powerset_BD_Sha
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_is_disjoint_from_Pointset_Powerset_BD_Shap
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_geometrically_covers_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_geometrically_equals_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_equals_Pointset_Powerset_BD_Shape_int64_t
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_OK :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_constraint :
  pointset_powerset_bd_shape_int64_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_congruence :
  pointset_powerset_bd_shape_int64_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_constraints :
  pointset_powerset_bd_shape_int64_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_congruences :
  pointset_powerset_bd_shape_int64_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_refine_with_constraint :
  pointset_powerset_bd_shape_int64_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_refine_with_congruence :
  pointset_powerset_bd_shape_int64_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_refine_with_constraints :
  pointset_powerset_bd_shape_int64_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_refine_with_congruences :
  pointset_powerset_bd_shape_int64_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_intersection_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_upper_bound_assign :
  pointset_powerset_bd_shape_int64_t ->
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  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_difference_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_concatenate_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_time_elapse_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_simplify_using_context_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_constrains :
  pointset_powerset_bd_shape_int64_t -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_unconstrain_space_dimension :
  pointset_powerset_bd_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_int64_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_affine_image :
  pointset_powerset_bd_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_affine_preimage :
  pointset_powerset_bd_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_bounded_affine_image :
  pointset_powerset_bd_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_bounded_affine_preimage :
  pointset_powerset_bd_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_generalized_affine_image :
  pointset_powerset_bd_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_generalized_affine_preimage :
  pointset_powerset_bd_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_int64_t ->
```

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  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_remove_space_dimensions :
  pointset_powerset_bd_shape_int64_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_expand_space_dimension :
  pointset_powerset_bd_shape_int64_t -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_fold_space_dimensions :
  pointset_powerset_bd_shape_int64_t -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_map_space_dimensions :
  pointset_powerset_bd_shape_int64_t -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_drop_some_non_integer_points :
  pointset_powerset_bd_shape_int64_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_int64_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_ascii_dump :
  pointset_powerset_bd_shape_int64_t -> string
val ppl_Pointset_Powerset_BD_Shape_int64_t_external_memory_in_bytes :
  pointset_powerset_bd_shape_int64_t -> int
val ppl_Pointset_Powerset_BD_Shape_int64_t_total_memory_in_bytes :
  pointset_powerset_bd_shape_int64_t -> int
val ppl_Pointset_Powerset_BD_Shape_int64_t_size :
  pointset_powerset_bd_shape_int64_t -> int
type pointset_powerset_bd_shape_int64_t_iterator
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_iterator_from_iterator :
  pointset_powerset_bd_shape_int64_t_iterator ->
  pointset_powerset_bd_shape_int64_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int64_t_begin_iterator :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int64_t_end_iterator :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int64_t_iterator_equals_iterator :
  pointset_powerset_bd_shape_int64_t_iterator ->
  pointset_powerset_bd_shape_int64_t_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_increment_iterator :
  pointset_powerset_bd_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_decrement_iterator :
  pointset_powerset_bd_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_get_disjunct :
  pointset_powerset_bd_shape_int64_t_iterator ->
```

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  bd_shape_int64_t
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_disjunct :
  pointset_powerset_bd_shape_int64_t ->
  bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_drop_disjunct :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_drop_disjuncts :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t_iterator ->
  pointset_powerset_bd_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> int -> unit
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_bd_shape_mpq_class
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_Pointset_Powerset_BD_Shape_mpq_
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_BD_Shape_mpq_class :
  bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_Pointset_Powerset_BD_Shape_mpq_
  pointset_powerset_bd_shape_mpq_class ->
  complexity_class -> pointset_powerset_bd_shape_mpq_class
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_BD_Shape_mpq_class_with_complex
  bd_shape_mpq_class ->
  complexity_class -> pointset_powerset_bd_shape_mpq_class
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_mpq_class
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_mpq_class
val ppl_Pointset_Powerset_BD_Shape_mpq_class_swap :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_space_dimension :
  pointset_powerset_bd_shape_mpq_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpq_class_affine_dimension :
  pointset_powerset_bd_shape_mpq_class -> int
```

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val ppl_Pointset_Powerset_BD_Shape_mpq_class_relation_with_constraint :
  pointset_powerset_bd_shape_mpq_class ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_mpq_class_relation_with_generator :
  pointset_powerset_bd_shape_mpq_class ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_mpq_class_relation_with_congruence :
  pointset_powerset_bd_shape_mpq_class ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_mpq_class_is_empty :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_is_universe :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_is_bounded :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_contains_integer_point :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_is_topologically_closed :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_is_discrete :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_topological_closure_assign :
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_pairwise_reduce :
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_omega_reduce :
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_bounds_from_above :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_bounds_from_below :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_maximize :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_minimize :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_maximize_with_point :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_mpq_class_minimize_with_point :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_mpq_class_contains_Pointset_Powerset_BD_Shape_mpq_
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
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val ppl_Pointset_Powerset_BD_Shape_mpq_class_strictly_contains_Pointset_Powerset_BD_S
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_is_disjoint_from_Pointset_Powerset_BD_Sh
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_geometrically_covers_Pointset_Powerset_B
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_geometrically_equals_Pointset_Powerset_B
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_equals_Pointset_Powerset_BD_Shape_mpq_cl
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_OK :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_constraint :
  pointset_powerset_bd_shape_mpq_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_congruence :
  pointset_powerset_bd_shape_mpq_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_constraints :
  pointset_powerset_bd_shape_mpq_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_congruences :
  pointset_powerset_bd_shape_mpq_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_refine_with_constraint :
  pointset_powerset_bd_shape_mpq_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_refine_with_congruence :
  pointset_powerset_bd_shape_mpq_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_refine_with_constraints :
  pointset_powerset_bd_shape_mpq_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_refine_with_congruences :
  pointset_powerset_bd_shape_mpq_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_intersection_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_upper_bound_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_difference_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
```

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val ppl_Pointset_Powerset_BD_Shape_mpq_class_concatenate_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_time_elapse_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_simplify_using_context_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_constrains :
  pointset_powerset_bd_shape_mpq_class -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_unconstrain_space_dimension :
  pointset_powerset_bd_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_mpq_class -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_affine_image :
  pointset_powerset_bd_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_affine_preimage :
  pointset_powerset_bd_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_bounded_affine_image :
  pointset_powerset_bd_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_bounded_affine_preimage :
  pointset_powerset_bd_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_generalized_affine_image :
  pointset_powerset_bd_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_generalized_affine_preimage :
  pointset_powerset_bd_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_mpq_class -> int -> unit
```

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val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_remove_space_dimensions :
  pointset_powerset_bd_shape_mpq_class -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_expand_space_dimension :
  pointset_powerset_bd_shape_mpq_class -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_fold_space_dimensions :
  pointset_powerset_bd_shape_mpq_class -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_map_space_dimensions :
  pointset_powerset_bd_shape_mpq_class -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_drop_some_non_integer_points :
  pointset_powerset_bd_shape_mpq_class ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_mpq_class ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_ascii_dump :
  pointset_powerset_bd_shape_mpq_class -> string
val ppl_Pointset_Powerset_BD_Shape_mpq_class_external_memory_in_bytes :
  pointset_powerset_bd_shape_mpq_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpq_class_total_memory_in_bytes :
  pointset_powerset_bd_shape_mpq_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpq_class_size :
  pointset_powerset_bd_shape_mpq_class -> int
type pointset_powerset_bd_shape_mpq_class_iterator
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_iterator_from_iterator :
  pointset_powerset_bd_shape_mpq_class_iterator ->
  pointset_powerset_bd_shape_mpq_class_iterator
val ppl_Pointset_Powerset_BD_Shape_mpq_class_begin_iterator :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class_iterator
val ppl_Pointset_Powerset_BD_Shape_mpq_class_end_iterator :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class_iterator
val ppl_Pointset_Powerset_BD_Shape_mpq_class_iterator_equals_iterator :
  pointset_powerset_bd_shape_mpq_class_iterator ->
  pointset_powerset_bd_shape_mpq_class_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_increment_iterator :
  pointset_powerset_bd_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_decrement_iterator :
  pointset_powerset_bd_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_get_disjunct :
  pointset_powerset_bd_shape_mpq_class_iterator ->
  bd_shape_mpq_class
val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_disjunct :
  pointset_powerset_bd_shape_mpq_class ->
  bd_shape_mpq_class -> unit
```

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val ppl_Pointset_Powerset_BD_Shape_mpq_class_drop_disjunct :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_drop_disjuncts :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class_iterator ->
  pointset_powerset_bd_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> int -> unit
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_bd_shape_mpz_class
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_Pointset_Powerset_BD_Shape_mpz_
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_BD_Shape_mpz_class :
  bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_Pointset_Powerset_BD_Shape_mpz_
  pointset_powerset_bd_shape_mpz_class ->
  complexity_class -> pointset_powerset_bd_shape_mpz_class
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_BD_Shape_mpz_class_with_complex
  bd_shape_mpz_class ->
  complexity_class -> pointset_powerset_bd_shape_mpz_class
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_mpz_class
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_mpz_class
val ppl_Pointset_Powerset_BD_Shape_mpz_class_swap :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_space_dimension :
  pointset_powerset_bd_shape_mpz_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpz_class_affine_dimension :
  pointset_powerset_bd_shape_mpz_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpz_class_relation_with_constraint :
  pointset_powerset_bd_shape_mpz_class ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_mpz_class_relation_with_generator :
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  pointset_powerset_bd_shape_mpz_class ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_mpz_class_relation_with_congruence :
  pointset_powerset_bd_shape_mpz_class ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_mpz_class_is_empty :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_is_universe :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_is_bounded :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_contains_integer_point :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_is_topologically_closed :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_is_discrete :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_topological_closure_assign :
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_pairwise_reduce :
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_omega_reduce :
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_bounds_from_above :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_bounds_from_below :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_maximize :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_minimize :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_maximize_with_point :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_mpz_class_minimize_with_point :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_mpz_class_contains_Pointset_Powerset_BD_Shape_mpz_
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_strictly_contains_Pointset_Powerset_BD_S
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
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val ppl_Pointset_Powerset_BD_Shape_mpz_class_is_disjoint_from_Pointset_Powerset_BD_Sh
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_geometrically_covers_Pointset_Powerset_B
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_geometrically_equals_Pointset_Powerset_B
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_equals_Pointset_Powerset_BD_Shape_mpz_cl
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_OK :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_constraint :
  pointset_powerset_bd_shape_mpz_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_congruence :
  pointset_powerset_bd_shape_mpz_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_constraints :
  pointset_powerset_bd_shape_mpz_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_congruences :
  pointset_powerset_bd_shape_mpz_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_refine_with_constraint :
  pointset_powerset_bd_shape_mpz_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_refine_with_congruence :
  pointset_powerset_bd_shape_mpz_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_refine_with_constraints :
  pointset_powerset_bd_shape_mpz_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_refine_with_congruences :
  pointset_powerset_bd_shape_mpz_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_intersection_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_upper_bound_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_difference_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_concatenate_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
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val ppl_Pointset_Powerset_BD_Shape_mpz_class_time_elapse_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_simplify_using_context_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_constrains :
  pointset_powerset_bd_shape_mpz_class -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_unconstrain_space_dimension :
  pointset_powerset_bd_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_mpz_class -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_affine_image :
  pointset_powerset_bd_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_affine_preimage :
  pointset_powerset_bd_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_bounded_affine_image :
  pointset_powerset_bd_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_bounded_affine_preimage :
  pointset_powerset_bd_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_image :
  pointset_powerset_bd_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_preimage :
  pointset_powerset_bd_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_remove_space_dimensions :
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  pointset_powerset_bd_shape_mpz_class -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_expand_space_dimension :
  pointset_powerset_bd_shape_mpz_class -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_fold_space_dimensions :
  pointset_powerset_bd_shape_mpz_class -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_map_space_dimensions :
  pointset_powerset_bd_shape_mpz_class -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_drop_some_non_integer_points :
  pointset_powerset_bd_shape_mpz_class ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_mpz_class ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_ascii_dump :
  pointset_powerset_bd_shape_mpz_class -> string
val ppl_Pointset_Powerset_BD_Shape_mpz_class_external_memory_in_bytes :
  pointset_powerset_bd_shape_mpz_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpz_class_total_memory_in_bytes :
  pointset_powerset_bd_shape_mpz_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpz_class_size :
  pointset_powerset_bd_shape_mpz_class -> int
type pointset_powerset_bd_shape_mpz_class_iterator
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_iterator_from_iterator :
  pointset_powerset_bd_shape_mpz_class_iterator ->
  pointset_powerset_bd_shape_mpz_class_iterator
val ppl_Pointset_Powerset_BD_Shape_mpz_class_begin_iterator :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class_iterator
val ppl_Pointset_Powerset_BD_Shape_mpz_class_end_iterator :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class_iterator
val ppl_Pointset_Powerset_BD_Shape_mpz_class_iterator_equals_iterator :
  pointset_powerset_bd_shape_mpz_class_iterator ->
  pointset_powerset_bd_shape_mpz_class_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_increment_iterator :
  pointset_powerset_bd_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_decrement_iterator :
  pointset_powerset_bd_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_get_disjunct :
  pointset_powerset_bd_shape_mpz_class_iterator ->
  bd_shape_mpz_class
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_disjunct :
  pointset_powerset_bd_shape_mpz_class ->
  bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_drop_disjunct :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class_iterator -> unit
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val ppl_Pointset_Powerset_BD_Shape_mpz_class_drop_disjuncts :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class_iterator ->
  pointset_powerset_bd_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_Pointset_Powerset_Octagonal
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_Pointset_Powerset_Octagonal
  pointset_powerset_octagonal_shape_int8_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_Octagonal_Shape_int8_t_with
  octagonal_shape_int8_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_swap :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_space_dimension :
  pointset_powerset_octagonal_shape_int8_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_affine_dimension :
  pointset_powerset_octagonal_shape_int8_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_relation_with_constraint :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_constraint -> poly_con_relation list
```

```
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_relation_with_generator :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_relation_with_congruence :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_empty :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_universe :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_bounded :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_contains_integer_point :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_topologically_closed :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_discrete :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_topological_closure_assign :
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_pairwise_reduce :
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_omega_reduce :
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_bounds_from_above :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_bounds_from_below :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_maximize :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_minimize :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_maximize_with_point :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_minimize_with_point :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_contains_Pointset_Powerset_Octagonal
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_strictly_contains_Pointset_Powerset_
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
```

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val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_disjoint_from_Pointset_Powerset_O
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_geometrically_covers_Pointset_Powers
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_geometrically_equals_Pointset_Powers
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_equals_Pointset_Powerset_Octagonal_S
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_OK :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_constraint :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_congruence :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_constraints :
  pointset_powerset_octagonal_shape_int8_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_congruences :
  pointset_powerset_octagonal_shape_int8_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_refine_with_constraint :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_refine_with_congruence :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_refine_with_constraints :
  pointset_powerset_octagonal_shape_int8_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_refine_with_congruences :
  pointset_powerset_octagonal_shape_int8_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_intersection_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_upper_bound_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_difference_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_concatenate_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
```

```
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_time_elapse_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_constrains :
  pointset_powerset_octagonal_shape_int8_t -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_int8_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_affine_image :
  pointset_powerset_octagonal_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_affine_preimage :
  pointset_powerset_octagonal_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_bounded_affine_image :
  pointset_powerset_octagonal_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_generalized_affine_image :
  pointset_powerset_octagonal_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_generalized_affine_preimage_lhs_rhs
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_space_dimensions_and_project :
  pointset_powerset_octagonal_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_remove_space_dimensions :
```

```
  pointset_powerset_octagonal_shape_int8_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_expand_space_dimension :
  pointset_powerset_octagonal_shape_int8_t -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_fold_space_dimensions :
  pointset_powerset_octagonal_shape_int8_t -> int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_map_space_dimensions :
  pointset_powerset_octagonal_shape_int8_t ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_int8_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_int8_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_ascii_dump :
  pointset_powerset_octagonal_shape_int8_t -> string
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_int8_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_int8_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_size :
  pointset_powerset_octagonal_shape_int8_t -> int
type pointset_powerset_octagonal_shape_int8_t_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_iterator_from_iterator :
  pointset_powerset_octagonal_shape_int8_t_iterator ->
  pointset_powerset_octagonal_shape_int8_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_begin_iterator :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_end_iterator :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_int8_t_iterator ->
  pointset_powerset_octagonal_shape_int8_t_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_increment_iterator :
  pointset_powerset_octagonal_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_decrement_iterator :
  pointset_powerset_octagonal_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_get_disjunct :
  pointset_powerset_octagonal_shape_int8_t_iterator ->
  octagonal_shape_int8_t
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_disjunct :
  pointset_powerset_octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_drop_disjunct :
  pointset_powerset_octagonal_shape_int8_t ->
```

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  pointset_powerset_octagonal_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_drop_disjuncts :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t_iterator ->
  pointset_powerset_octagonal_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int16_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_Octagonal_Shape_int16_t_wi
  octagonal_shape_int16_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_swap :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_space_dimension :
  pointset_powerset_octagonal_shape_int16_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_affine_dimension :
  pointset_powerset_octagonal_shape_int16_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_relation_with_constraint :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_relation_with_generator :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_relation_with_congruence :
  pointset_powerset_octagonal_shape_int16_t ->
```

```
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is_empty :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is_universe :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is_bounded :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_contains_integer_point :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is_topologically_closed :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is_discrete :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_topological_closure_assign :
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_pairwise_reduce :
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_omega_reduce :
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_bounds_from_above :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_bounds_from_below :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_maximize :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_minimize :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_maximize_with_point :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_minimize_with_point :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_contains_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_strictly_contains_Pointset_Powerset
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is_disjoint_from_Pointset_Powerset_
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_geometrically_covers_Pointset_Power
```

```
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_geometrically_equals_Pointset_Power
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_equals_Pointset_Powerset_Octagonal_
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_OK :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_constraint :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_congruence :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_constraints :
  pointset_powerset_octagonal_shape_int16_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_congruences :
  pointset_powerset_octagonal_shape_int16_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_refine_with_constraint :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_refine_with_congruence :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_refine_with_constraints :
  pointset_powerset_octagonal_shape_int16_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_refine_with_congruences :
  pointset_powerset_octagonal_shape_int16_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_intersection_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_upper_bound_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_difference_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_concatenate_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_time_elapse_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_upper_bound_assign_if_exact :
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  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_constrains :
  pointset_powerset_octagonal_shape_int16_t -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_int16_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_affine_image :
  pointset_powerset_octagonal_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_affine_preimage :
  pointset_powerset_octagonal_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_bounded_affine_image :
  pointset_powerset_octagonal_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_generalized_affine_image :
  pointset_powerset_octagonal_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_generalized_affine_preimage_lhs_rhs
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_space_dimensions_and_project :
  pointset_powerset_octagonal_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_remove_space_dimensions :
  pointset_powerset_octagonal_shape_int16_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_expand_space_dimension :
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  pointset_powerset_octagonal_shape_int16_t -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_fold_space_dimensions :
  pointset_powerset_octagonal_shape_int16_t ->
  int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_map_space_dimensions :
  pointset_powerset_octagonal_shape_int16_t ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_int16_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_int16_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_ascii_dump :
  pointset_powerset_octagonal_shape_int16_t -> string
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_int16_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_int16_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_size :
  pointset_powerset_octagonal_shape_int16_t -> int
type pointset_powerset_octagonal_shape_int16_t_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_iterator_from_iterator :
  pointset_powerset_octagonal_shape_int16_t_iterator ->
  pointset_powerset_octagonal_shape_int16_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_begin_iterator :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_end_iterator :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_int16_t_iterator ->
  pointset_powerset_octagonal_shape_int16_t_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_increment_iterator :
  pointset_powerset_octagonal_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_decrement_iterator :
  pointset_powerset_octagonal_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_get_disjunct :
  pointset_powerset_octagonal_shape_int16_t_iterator ->
  octagonal_shape_int16_t
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_disjunct :
  pointset_powerset_octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_drop_disjunct :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_drop_disjuncts :
  pointset_powerset_octagonal_shape_int16_t ->
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  pointset_powerset_octagonal_shape_int16_t_iterator ->
  pointset_powerset_octagonal_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int32_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_Octagonal_Shape_int32_t_wi
  octagonal_shape_int32_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_swap :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_space_dimension :
  pointset_powerset_octagonal_shape_int32_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_affine_dimension :
  pointset_powerset_octagonal_shape_int32_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_relation_with_constraint :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_relation_with_generator :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_relation_with_congruence :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_empty :
  pointset_powerset_octagonal_shape_int32_t -> bool
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val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_universe :
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_bounded :
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_contains_integer_point :
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_topologically_closed :
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_discrete :
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_topological_closure_assign :
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_pairwise_reduce :
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_omega_reduce :
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_bounds_from_above :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_bounds_from_below :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_maximize :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_minimize :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_maximize_with_point :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_minimize_with_point :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_contains_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_strictly_contains_Pointset_Powerset
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_disjoint_from_Pointset_Powerset_
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_geometrically_covers_Pointset_Power
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_geometrically_equals_Pointset_Power
  pointset_powerset_octagonal_shape_int32_t ->
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  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_equals_Pointset_Powerset_Octagonal_
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_OK :
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_constraint :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_congruence :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_constraints :
  pointset_powerset_octagonal_shape_int32_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_congruences :
  pointset_powerset_octagonal_shape_int32_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_refine_with_constraint :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_refine_with_congruence :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_refine_with_constraints :
  pointset_powerset_octagonal_shape_int32_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_refine_with_congruences :
  pointset_powerset_octagonal_shape_int32_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_intersection_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_upper_bound_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_difference_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_concatenate_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_time_elapse_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_int32_t ->
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  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_constrains :
  pointset_powerset_octagonal_shape_int32_t -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_int32_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_affine_image :
  pointset_powerset_octagonal_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_affine_preimage :
  pointset_powerset_octagonal_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_bounded_affine_image :
  pointset_powerset_octagonal_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_generalized_affine_image :
  pointset_powerset_octagonal_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_generalized_affine_preimage_lhs_rhs
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_space_dimensions_and_project :
  pointset_powerset_octagonal_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_remove_space_dimensions :
  pointset_powerset_octagonal_shape_int32_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_expand_space_dimension :
  pointset_powerset_octagonal_shape_int32_t -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_fold_space_dimensions :
  pointset_powerset_octagonal_shape_int32_t ->
  int list -> int -> unit
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val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_map_space_dimensions :
  pointset_powerset_octagonal_shape_int32_t ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_int32_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_int32_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_ascii_dump :
  pointset_powerset_octagonal_shape_int32_t -> string
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_int32_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_int32_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_size :
  pointset_powerset_octagonal_shape_int32_t -> int
type pointset_powerset_octagonal_shape_int32_t_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_iterator_from_iterator :
  pointset_powerset_octagonal_shape_int32_t_iterator ->
  pointset_powerset_octagonal_shape_int32_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_begin_iterator :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_end_iterator :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_int32_t_iterator ->
  pointset_powerset_octagonal_shape_int32_t_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_increment_iterator :
  pointset_powerset_octagonal_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_decrement_iterator :
  pointset_powerset_octagonal_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_get_disjunct :
  pointset_powerset_octagonal_shape_int32_t_iterator ->
  octagonal_shape_int32_t
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_disjunct :
  pointset_powerset_octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_drop_disjunct :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_drop_disjuncts :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t_iterator ->
  pointset_powerset_octagonal_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
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val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int64_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_Octagonal_Shape_int64_t_wi
  octagonal_shape_int64_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_swap :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_space_dimension :
  pointset_powerset_octagonal_shape_int64_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_affine_dimension :
  pointset_powerset_octagonal_shape_int64_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_relation_with_constraint :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_relation_with_generator :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_relation_with_congruence :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_empty :
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_universe :
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_bounded :
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_contains_integer_point :
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  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_topologically_closed :
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_discrete :
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_topological_closure_assign :
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_pairwise_reduce :
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_omega_reduce :
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bounds_from_above :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bounds_from_below :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_maximize :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_minimize :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_maximize_with_point :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_minimize_with_point :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_contains_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_strictly_contains_Pointset_Powerset
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_disjoint_from_Pointset_Powerset_
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_geometrically_covers_Pointset_Power
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_geometrically_equals_Pointset_Power
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_equals_Pointset_Powerset_Octagonal_
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_OK :
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  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_constraint :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_congruence :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_constraints :
  pointset_powerset_octagonal_shape_int64_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_congruences :
  pointset_powerset_octagonal_shape_int64_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_refine_with_constraint :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_refine_with_congruence :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_refine_with_constraints :
  pointset_powerset_octagonal_shape_int64_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_refine_with_congruences :
  pointset_powerset_octagonal_shape_int64_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_intersection_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_upper_bound_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_difference_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_concatenate_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_time_elapse_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_constrains :
  pointset_powerset_octagonal_shape_int64_t -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_int64_t -> int -> unit
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val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_int64_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_affine_image :
  pointset_powerset_octagonal_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_affine_preimage :
  pointset_powerset_octagonal_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bounded_affine_image :
  pointset_powerset_octagonal_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_generalized_affine_image :
  pointset_powerset_octagonal_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_generalized_affine_preimage_lhs_rhs
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_space_dimensions_and_project :
  pointset_powerset_octagonal_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_remove_space_dimensions :
  pointset_powerset_octagonal_shape_int64_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_expand_space_dimension :
  pointset_powerset_octagonal_shape_int64_t -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_fold_space_dimensions :
  pointset_powerset_octagonal_shape_int64_t ->
  int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_map_space_dimensions :
  pointset_powerset_octagonal_shape_int64_t ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_int64_t ->
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  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_int64_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_ascii_dump :
  pointset_powerset_octagonal_shape_int64_t -> string
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_int64_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_int64_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_size :
  pointset_powerset_octagonal_shape_int64_t -> int
type pointset_powerset_octagonal_shape_int64_t_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_iterator_from_iterator :
  pointset_powerset_octagonal_shape_int64_t_iterator ->
  pointset_powerset_octagonal_shape_int64_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_begin_iterator :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_end_iterator :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_int64_t_iterator ->
  pointset_powerset_octagonal_shape_int64_t_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_increment_iterator :
  pointset_powerset_octagonal_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_decrement_iterator :
  pointset_powerset_octagonal_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_get_disjunct :
  pointset_powerset_octagonal_shape_int64_t_iterator ->
  octagonal_shape_int64_t
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_disjunct :
  pointset_powerset_octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_drop_disjunct :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_drop_disjuncts :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t_iterator ->
  pointset_powerset_octagonal_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_space_dimension :
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  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_Pointset_Powerset_Octago
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpq_clas
  octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_Pointset_Powerset_Octago
  pointset_powerset_octagonal_shape_mpq_class ->
  complexity_class ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpq_clas
  octagonal_shape_mpq_class ->
  complexity_class ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_swap :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_space_dimension :
  pointset_powerset_octagonal_shape_mpq_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_affine_dimension :
  pointset_powerset_octagonal_shape_mpq_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_relation_with_constraint :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_relation_with_generator :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_relation_with_congruence :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_is_empty :
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_is_universe :
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_is_bounded :
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_contains_integer_point :
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_is_topologically_closed :
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_is_discrete :
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  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_topological_closure_assign :
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_pairwise_reduce :
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_omega_reduce :
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_bounds_from_above :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_bounds_from_below :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_maximize :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_minimize :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_maximize_with_point :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_minimize_with_point :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_contains_Pointset_Powerset_Octago
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_strictly_contains_Pointset_Powers
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_is_disjoint_from_Pointset_Powerse
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_geometrically_covers_Pointset_Pow
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_geometrically_equals_Pointset_Pow
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_equals_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_OK :
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_constraint :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_constraint -> unit
```

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val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_congruence :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_constraints :
  pointset_powerset_octagonal_shape_mpq_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_congruences :
  pointset_powerset_octagonal_shape_mpq_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_refine_with_constraint :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_refine_with_congruence :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_refine_with_constraints :
  pointset_powerset_octagonal_shape_mpq_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_refine_with_congruences :
  pointset_powerset_octagonal_shape_mpq_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_intersection_assign :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_upper_bound_assign :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_difference_assign :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_concatenate_assign :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_time_elapse_assign :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_constrains :
  pointset_powerset_octagonal_shape_mpq_class -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_mpq_class -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_affine_image :
  pointset_powerset_octagonal_shape_mpq_class ->
```

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  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_affine_preimage :
  pointset_powerset_octagonal_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_bounded_affine_image :
  pointset_powerset_octagonal_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_generalized_affine_image :
  pointset_powerset_octagonal_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_generalized_affine_image_lhs_rhs
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_generalized_affine_preimage_lhs_r
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_space_dimensions_and_project
  pointset_powerset_octagonal_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_remove_space_dimensions :
  pointset_powerset_octagonal_shape_mpq_class -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_expand_space_dimension :
  pointset_powerset_octagonal_shape_mpq_class -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_fold_space_dimensions :
  pointset_powerset_octagonal_shape_mpq_class ->
  int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_map_space_dimensions :
  pointset_powerset_octagonal_shape_mpq_class ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_mpq_class ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_mpq_class ->
  int list -> complexity_class -> unit
```

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val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_ascii_dump :
  pointset_powerset_octagonal_shape_mpq_class -> string
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_mpq_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_mpq_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_size :
  pointset_powerset_octagonal_shape_mpq_class -> int
type pointset_powerset_octagonal_shape_mpq_class_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_iterator_from_iterator :
  pointset_powerset_octagonal_shape_mpq_class_iterator ->
  pointset_powerset_octagonal_shape_mpq_class_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_begin_iterator :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_end_iterator :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_mpq_class_iterator ->
  pointset_powerset_octagonal_shape_mpq_class_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_increment_iterator :
  pointset_powerset_octagonal_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_decrement_iterator :
  pointset_powerset_octagonal_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_get_disjunct :
  pointset_powerset_octagonal_shape_mpq_class_iterator ->
  octagonal_shape_mpq_class
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_disjunct :
  pointset_powerset_octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_drop_disjunct :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_drop_disjuncts :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class_iterator ->
  pointset_powerset_octagonal_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_BHZ03_H79_BHMZ05_widening_assign
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_BGP99_BHMZ05_extrapolation_assign
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_mpz_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Pointset_Powerset_Octago
  pointset_powerset_octagonal_shape_mpz_class ->
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  pointset_powerset_octagonal_shape_mpz_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_clas
  octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Pointset_Powerset_Octago
  pointset_powerset_octagonal_shape_mpz_class ->
  complexity_class ->
  pointset_powerset_octagonal_shape_mpz_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_clas
  octagonal_shape_mpz_class ->
  complexity_class ->
  pointset_powerset_octagonal_shape_mpz_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_mpz_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_mpz_class
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_swap :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_space_dimension :
  pointset_powerset_octagonal_shape_mpz_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_affine_dimension :
  pointset_powerset_octagonal_shape_mpz_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_relation_with_constraint :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_relation_with_generator :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_relation_with_congruence :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_empty :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_universe :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_bounded :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_contains_integer_point :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_topologically_closed :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_discrete :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_topological_closure_assign :
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_pairwise_reduce :
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  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_omega_reduce :
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_bounds_from_above :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_bounds_from_below :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_maximize :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_minimize :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_maximize_with_point :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_minimize_with_point :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_contains_Pointset_Powerset_Octago
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_strictly_contains_Pointset_Powers
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_disjoint_from_Pointset_Powerse
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_geometrically_covers_Pointset_Pow
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_geometrically_equals_Pointset_Pow
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_equals_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_OK :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_constraint :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_congruence :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_constraints :
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  pointset_powerset_octagonal_shape_mpz_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_congruences :
  pointset_powerset_octagonal_shape_mpz_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_refine_with_constraint :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_refine_with_congruence :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_refine_with_constraints :
  pointset_powerset_octagonal_shape_mpz_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_refine_with_congruences :
  pointset_powerset_octagonal_shape_mpz_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_intersection_assign :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_upper_bound_assign :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_difference_assign :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_concatenate_assign :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_time_elapse_assign :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_constrains :
  pointset_powerset_octagonal_shape_mpz_class -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_mpz_class -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_affine_image :
  pointset_powerset_octagonal_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_affine_preimage :
  pointset_powerset_octagonal_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
```

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val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_bounded_affine_image :
  pointset_powerset_octagonal_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_generalized_affine_image :
  pointset_powerset_octagonal_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_generalized_affine_image_lhs_rhs
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_generalized_affine_preimage_lhs_r
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_space_dimensions_and_project
  pointset_powerset_octagonal_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_remove_space_dimensions :
  pointset_powerset_octagonal_shape_mpz_class -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_expand_space_dimension :
  pointset_powerset_octagonal_shape_mpz_class -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_fold_space_dimensions :
  pointset_powerset_octagonal_shape_mpz_class ->
  int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_map_space_dimensions :
  pointset_powerset_octagonal_shape_mpz_class ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_mpz_class ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_mpz_class ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_ascii_dump :
  pointset_powerset_octagonal_shape_mpz_class -> string
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_mpz_class -> int
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val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_mpz_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_size :
  pointset_powerset_octagonal_shape_mpz_class -> int
type pointset_powerset_octagonal_shape_mpz_class_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_iterator_from_iterator :
  pointset_powerset_octagonal_shape_mpz_class_iterator ->
  pointset_powerset_octagonal_shape_mpz_class_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_begin_iterator :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_end_iterator :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_mpz_class_iterator ->
  pointset_powerset_octagonal_shape_mpz_class_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_increment_iterator :
  pointset_powerset_octagonal_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_decrement_iterator :
  pointset_powerset_octagonal_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_get_disjunct :
  pointset_powerset_octagonal_shape_mpz_class_iterator ->
  octagonal_shape_mpz_class
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_disjunct :
  pointset_powerset_octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_drop_disjunct :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_drop_disjuncts :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class_iterator ->
  pointset_powerset_octagonal_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_BHZ03_H79_BHMZ05_widening_assign
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_BGP99_BHMZ05_extrapolation_assign
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> int -> unit
val ppl_new_Pointset_Powerset_C_Polyhedron_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_c_polyhedron
val ppl_new_Pointset_Powerset_C_Polyhedron_from_Pointset_Powerset_C_Polyhedron :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron
val ppl_new_Pointset_Powerset_C_Polyhedron_from_C_Polyhedron :
  polyhedron -> pointset_powerset_c_polyhedron
val ppl_new_Pointset_Powerset_C_Polyhedron_from_Pointset_Powerset_C_Polyhedron_with_c
  pointset_powerset_c_polyhedron ->
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  complexity_class -> pointset_powerset_c_polyhedron
val ppl_new_Pointset_Powerset_C_Polyhedron_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> pointset_powerset_c_polyhedron
val ppl_new_Pointset_Powerset_C_Polyhedron_from_constraints :
  constraint_system -> pointset_powerset_c_polyhedron
val ppl_new_Pointset_Powerset_C_Polyhedron_from_congruences :
  congruence_system -> pointset_powerset_c_polyhedron
val ppl_Pointset_Powerset_C_Polyhedron_swap :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_space_dimension :
  pointset_powerset_c_polyhedron -> int
val ppl_Pointset_Powerset_C_Polyhedron_affine_dimension :
  pointset_powerset_c_polyhedron -> int
val ppl_Pointset_Powerset_C_Polyhedron_relation_with_constraint :
  pointset_powerset_c_polyhedron ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_C_Polyhedron_relation_with_generator :
  pointset_powerset_c_polyhedron ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_C_Polyhedron_relation_with_congruence :
  pointset_powerset_c_polyhedron ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_C_Polyhedron_is_empty :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_is_universe :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_is_bounded :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_contains_integer_point :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_is_topologically_closed :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_is_discrete :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_topological_closure_assign :
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_pairwise_reduce :
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_omega_reduce :
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_bounds_from_above :
  pointset_powerset_c_polyhedron ->
  linear_expression -> bool
val ppl_Pointset_Powerset_C_Polyhedron_bounds_from_below :
  pointset_powerset_c_polyhedron ->
  linear_expression -> bool
val ppl_Pointset_Powerset_C_Polyhedron_maximize :
```

```
  pointset_powerset_c_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_C_Polyhedron_minimize :
  pointset_powerset_c_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_C_Polyhedron_maximize_with_point :
  pointset_powerset_c_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_C_Polyhedron_minimize_with_point :
  pointset_powerset_c_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_C_Polyhedron_contains_Pointset_Powerset_C_Polyhedron :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_strictly_contains_Pointset_Powerset_C_Polyhedr
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_is_disjoint_from_Pointset_Powerset_C_Polyhedro
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_geometrically_covers_Pointset_Powerset_C_Polyh
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_geometrically_equals_Pointset_Powerset_C_Polyh
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_equals_Pointset_Powerset_C_Polyhedron :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_OK :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_add_constraint :
  pointset_powerset_c_polyhedron ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_C_Polyhedron_add_congruence :
  pointset_powerset_c_polyhedron ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_C_Polyhedron_add_constraints :
  pointset_powerset_c_polyhedron ->
  constraint_system -> unit
val ppl_Pointset_Powerset_C_Polyhedron_add_congruences :
  pointset_powerset_c_polyhedron ->
  congruence_system -> unit
val ppl_Pointset_Powerset_C_Polyhedron_refine_with_constraint :
  pointset_powerset_c_polyhedron ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_C_Polyhedron_refine_with_congruence :
  pointset_powerset_c_polyhedron ->
```

```
  linear_congruence -> unit
val ppl_Pointset_Powerset_C_Polyhedron_refine_with_constraints :
  pointset_powerset_c_polyhedron ->
  constraint_system -> unit
val ppl_Pointset_Powerset_C_Polyhedron_refine_with_congruences :
  pointset_powerset_c_polyhedron ->
  congruence_system -> unit
val ppl_Pointset_Powerset_C_Polyhedron_intersection_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_upper_bound_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_difference_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_concatenate_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_time_elapse_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_upper_bound_assign_if_exact :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_simplify_using_context_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_constrains :
  pointset_powerset_c_polyhedron -> int -> bool
val ppl_Pointset_Powerset_C_Polyhedron_unconstrain_space_dimension :
  pointset_powerset_c_polyhedron -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_unconstrain_space_dimensions :
  pointset_powerset_c_polyhedron -> int list -> unit
val ppl_Pointset_Powerset_C_Polyhedron_affine_image :
  pointset_powerset_c_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_C_Polyhedron_affine_preimage :
  pointset_powerset_c_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_C_Polyhedron_bounded_affine_image :
  pointset_powerset_c_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_C_Polyhedron_bounded_affine_preimage :
  pointset_powerset_c_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_image :
  pointset_powerset_c_polyhedron ->
```

```
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_preimage :
  pointset_powerset_c_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_image_lhs_rhs :
  pointset_powerset_c_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_c_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_C_Polyhedron_add_space_dimensions_and_embed :
  pointset_powerset_c_polyhedron -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_add_space_dimensions_and_project :
  pointset_powerset_c_polyhedron -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_remove_space_dimensions :
  pointset_powerset_c_polyhedron -> int list -> unit
val ppl_Pointset_Powerset_C_Polyhedron_remove_higher_space_dimensions :
  pointset_powerset_c_polyhedron -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_expand_space_dimension :
  pointset_powerset_c_polyhedron -> int -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_fold_space_dimensions :
  pointset_powerset_c_polyhedron -> int list -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_map_space_dimensions :
  pointset_powerset_c_polyhedron -> (int * int) list -> unit
val ppl_Pointset_Powerset_C_Polyhedron_drop_some_non_integer_points :
  pointset_powerset_c_polyhedron ->
  complexity_class -> unit
val ppl_Pointset_Powerset_C_Polyhedron_drop_some_non_integer_points_2 :
  pointset_powerset_c_polyhedron ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_C_Polyhedron_ascii_dump :
  pointset_powerset_c_polyhedron -> string
val ppl_Pointset_Powerset_C_Polyhedron_external_memory_in_bytes :
  pointset_powerset_c_polyhedron -> int
val ppl_Pointset_Powerset_C_Polyhedron_total_memory_in_bytes :
  pointset_powerset_c_polyhedron -> int
val ppl_Pointset_Powerset_C_Polyhedron_size :
  pointset_powerset_c_polyhedron -> int
type pointset_powerset_c_polyhedron_iterator
val ppl_new_Pointset_Powerset_C_Polyhedron_iterator_from_iterator :
  pointset_powerset_c_polyhedron_iterator ->
  pointset_powerset_c_polyhedron_iterator
val ppl_Pointset_Powerset_C_Polyhedron_begin_iterator :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron_iterator
```

```
val ppl_Pointset_Powerset_C_Polyhedron_end_iterator :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron_iterator
val ppl_Pointset_Powerset_C_Polyhedron_iterator_equals_iterator :
  pointset_powerset_c_polyhedron_iterator ->
  pointset_powerset_c_polyhedron_iterator -> bool
val ppl_Pointset_Powerset_C_Polyhedron_increment_iterator :
  pointset_powerset_c_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_C_Polyhedron_decrement_iterator :
  pointset_powerset_c_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_C_Polyhedron_get_disjunct :
  pointset_powerset_c_polyhedron_iterator -> polyhedron
val ppl_Pointset_Powerset_C_Polyhedron_add_disjunct :
  pointset_powerset_c_polyhedron -> polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_drop_disjunct :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_C_Polyhedron_drop_disjuncts :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron_iterator ->
  pointset_powerset_c_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_C_Polyhedron_BHZ03_BHRZ03_BHRZ03_widening_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_BHZ03_H79_H79_widening_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_BGP99_BHRZ03_extrapolation_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_BGP99_H79_extrapolation_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> int -> unit
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_nnc_polyhedron
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_Pointset_Powerset_NNC_Polyhedron :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_NNC_Polyhedron :
  polyhedron -> pointset_powerset_nnc_polyhedron
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_Pointset_Powerset_NNC_Polyhedron_wi
  pointset_powerset_nnc_polyhedron ->
  complexity_class -> pointset_powerset_nnc_polyhedron
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> pointset_powerset_nnc_polyhedron
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_constraints :
  constraint_system -> pointset_powerset_nnc_polyhedron
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_congruences :
```

```
  congruence_system -> pointset_powerset_nnc_polyhedron
val ppl_Pointset_Powerset_NNC_Polyhedron_swap :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_space_dimension :
  pointset_powerset_nnc_polyhedron -> int
val ppl_Pointset_Powerset_NNC_Polyhedron_affine_dimension :
  pointset_powerset_nnc_polyhedron -> int
val ppl_Pointset_Powerset_NNC_Polyhedron_relation_with_constraint :
  pointset_powerset_nnc_polyhedron ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_NNC_Polyhedron_relation_with_generator :
  pointset_powerset_nnc_polyhedron ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_NNC_Polyhedron_relation_with_congruence :
  pointset_powerset_nnc_polyhedron ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_NNC_Polyhedron_is_empty :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_is_universe :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_is_bounded :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_contains_integer_point :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_is_topologically_closed :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_is_discrete :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_topological_closure_assign :
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_pairwise_reduce :
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_omega_reduce :
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_bounds_from_above :
  pointset_powerset_nnc_polyhedron ->
  linear_expression -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_bounds_from_below :
  pointset_powerset_nnc_polyhedron ->
  linear_expression -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_maximize :
  pointset_powerset_nnc_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_NNC_Polyhedron_minimize :
  pointset_powerset_nnc_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_NNC_Polyhedron_maximize_with_point :
  pointset_powerset_nnc_polyhedron ->
```

```
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_NNC_Polyhedron_minimize_with_point :
  pointset_powerset_nnc_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_NNC_Polyhedron_contains_Pointset_Powerset_NNC_Polyhedron :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_strictly_contains_Pointset_Powerset_NNC_Poly
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_is_disjoint_from_Pointset_Powerset_NNC_Polyh
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_geometrically_covers_Pointset_Powerset_NNC_P
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_geometrically_equals_Pointset_Powerset_NNC_P
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_equals_Pointset_Powerset_NNC_Polyhedron :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_OK :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_add_constraint :
  pointset_powerset_nnc_polyhedron ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_add_congruence :
  pointset_powerset_nnc_polyhedron ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_add_constraints :
  pointset_powerset_nnc_polyhedron ->
  constraint_system -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_add_congruences :
  pointset_powerset_nnc_polyhedron ->
  congruence_system -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_refine_with_constraint :
  pointset_powerset_nnc_polyhedron ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_refine_with_congruence :
  pointset_powerset_nnc_polyhedron ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_refine_with_constraints :
  pointset_powerset_nnc_polyhedron ->
  constraint_system -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_refine_with_congruences :
  pointset_powerset_nnc_polyhedron ->
  congruence_system -> unit
```

```
val ppl_Pointset_Powerset_NNC_Polyhedron_intersection_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_upper_bound_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_difference_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_concatenate_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_time_elapse_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_upper_bound_assign_if_exact :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_simplify_using_context_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_constrains :
  pointset_powerset_nnc_polyhedron -> int -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_unconstrain_space_dimension :
  pointset_powerset_nnc_polyhedron -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_unconstrain_space_dimensions :
  pointset_powerset_nnc_polyhedron -> int list -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_affine_image :
  pointset_powerset_nnc_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_affine_preimage :
  pointset_powerset_nnc_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_bounded_affine_image :
  pointset_powerset_nnc_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_bounded_affine_preimage :
  pointset_powerset_nnc_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_generalized_affine_image :
  pointset_powerset_nnc_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_generalized_affine_preimage :
  pointset_powerset_nnc_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_generalized_affine_image_lhs_rhs :
```

```
  pointset_powerset_nnc_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_nnc_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_add_space_dimensions_and_embed :
  pointset_powerset_nnc_polyhedron -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_add_space_dimensions_and_project :
  pointset_powerset_nnc_polyhedron -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_remove_space_dimensions :
  pointset_powerset_nnc_polyhedron -> int list -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_remove_higher_space_dimensions :
  pointset_powerset_nnc_polyhedron -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_expand_space_dimension :
  pointset_powerset_nnc_polyhedron -> int -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_fold_space_dimensions :
  pointset_powerset_nnc_polyhedron -> int list -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_map_space_dimensions :
  pointset_powerset_nnc_polyhedron -> (int * int) list -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_drop_some_non_integer_points :
  pointset_powerset_nnc_polyhedron ->
  complexity_class -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_drop_some_non_integer_points_2 :
  pointset_powerset_nnc_polyhedron ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_ascii_dump :
  pointset_powerset_nnc_polyhedron -> string
val ppl_Pointset_Powerset_NNC_Polyhedron_external_memory_in_bytes :
  pointset_powerset_nnc_polyhedron -> int
val ppl_Pointset_Powerset_NNC_Polyhedron_total_memory_in_bytes :
  pointset_powerset_nnc_polyhedron -> int
val ppl_Pointset_Powerset_NNC_Polyhedron_size :
  pointset_powerset_nnc_polyhedron -> int
type pointset_powerset_nnc_polyhedron_iterator
val ppl_new_Pointset_Powerset_NNC_Polyhedron_iterator_from_iterator :
  pointset_powerset_nnc_polyhedron_iterator ->
  pointset_powerset_nnc_polyhedron_iterator
val ppl_Pointset_Powerset_NNC_Polyhedron_begin_iterator :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron_iterator
val ppl_Pointset_Powerset_NNC_Polyhedron_end_iterator :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron_iterator
val ppl_Pointset_Powerset_NNC_Polyhedron_iterator_equals_iterator :
  pointset_powerset_nnc_polyhedron_iterator ->
  pointset_powerset_nnc_polyhedron_iterator -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_increment_iterator :
```

```
  pointset_powerset_nnc_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_decrement_iterator :
  pointset_powerset_nnc_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_get_disjunct :
  pointset_powerset_nnc_polyhedron_iterator -> polyhedron
val ppl_Pointset_Powerset_NNC_Polyhedron_add_disjunct :
  pointset_powerset_nnc_polyhedron -> polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_drop_disjunct :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_drop_disjuncts :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron_iterator ->
  pointset_powerset_nnc_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_BHZ03_BHRZ03_BHRZ03_widening_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_BHZ03_H79_H79_widening_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_BGP99_BHRZ03_extrapolation_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_BGP99_H79_extrapolation_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> int -> unit
val ppl_new_Pointset_Powerset_Grid_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_grid
val ppl_new_Pointset_Powerset_Grid_from_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid
val ppl_new_Pointset_Powerset_Grid_from_Grid : grid -> pointset_powerset_grid
val ppl_new_Pointset_Powerset_Grid_from_Pointset_Powerset_Grid_with_complexity :
  pointset_powerset_grid ->
  complexity_class -> pointset_powerset_grid
val ppl_new_Pointset_Powerset_Grid_from_Grid_with_complexity :
  grid ->
  complexity_class -> pointset_powerset_grid
val ppl_new_Pointset_Powerset_Grid_from_constraints :
  constraint_system -> pointset_powerset_grid
val ppl_new_Pointset_Powerset_Grid_from_congruences :
  congruence_system -> pointset_powerset_grid
val ppl_Pointset_Powerset_Grid_swap :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_space_dimension :
  pointset_powerset_grid -> int
val ppl_Pointset_Powerset_Grid_affine_dimension :
  pointset_powerset_grid -> int
val ppl_Pointset_Powerset_Grid_relation_with_constraint :
  pointset_powerset_grid ->
```

```
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Grid_relation_with_generator :
  pointset_powerset_grid ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Grid_relation_with_congruence :
  pointset_powerset_grid ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Grid_is_empty : pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_is_universe : pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_is_bounded : pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_contains_integer_point :
  pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_is_topologically_closed :
  pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_is_discrete : pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_topological_closure_assign :
  pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_pairwise_reduce :
  pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_omega_reduce : pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_bounds_from_above :
  pointset_powerset_grid -> linear_expression -> bool
val ppl_Pointset_Powerset_Grid_bounds_from_below :
  pointset_powerset_grid -> linear_expression -> bool
val ppl_Pointset_Powerset_Grid_maximize :
  pointset_powerset_grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Grid_minimize :
  pointset_powerset_grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Grid_maximize_with_point :
  pointset_powerset_grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Grid_minimize_with_point :
  pointset_powerset_grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Grid_contains_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_strictly_contains_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_is_disjoint_from_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_geometrically_covers_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_geometrically_equals_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
```

```
val ppl_Pointset_Powerset_Grid_equals_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_OK : pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_add_constraint :
  pointset_powerset_grid -> linear_constraint -> unit
val ppl_Pointset_Powerset_Grid_add_congruence :
  pointset_powerset_grid -> linear_congruence -> unit
val ppl_Pointset_Powerset_Grid_add_constraints :
  pointset_powerset_grid -> constraint_system -> unit
val ppl_Pointset_Powerset_Grid_add_congruences :
  pointset_powerset_grid -> congruence_system -> unit
val ppl_Pointset_Powerset_Grid_refine_with_constraint :
  pointset_powerset_grid -> linear_constraint -> unit
val ppl_Pointset_Powerset_Grid_refine_with_congruence :
  pointset_powerset_grid -> linear_congruence -> unit
val ppl_Pointset_Powerset_Grid_refine_with_constraints :
  pointset_powerset_grid -> constraint_system -> unit
val ppl_Pointset_Powerset_Grid_refine_with_congruences :
  pointset_powerset_grid -> congruence_system -> unit
val ppl_Pointset_Powerset_Grid_intersection_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_upper_bound_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_difference_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_concatenate_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_time_elapse_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_upper_bound_assign_if_exact :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_simplify_using_context_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_constrains :
  pointset_powerset_grid -> int -> bool
val ppl_Pointset_Powerset_Grid_unconstrain_space_dimension :
  pointset_powerset_grid -> int -> unit
val ppl_Pointset_Powerset_Grid_unconstrain_space_dimensions :
  pointset_powerset_grid -> int list -> unit
val ppl_Pointset_Powerset_Grid_affine_image :
  pointset_powerset_grid ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Grid_affine_preimage :
  pointset_powerset_grid ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Grid_bounded_affine_image :
  pointset_powerset_grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Pointset_Powerset_Grid_bounded_affine_preimage :
  pointset_powerset_grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Grid_generalized_affine_image :
  pointset_powerset_grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Grid_generalized_affine_preimage :
  pointset_powerset_grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Grid_generalized_affine_image_lhs_rhs :
  pointset_powerset_grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Grid_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Grid_add_space_dimensions_and_embed :
  pointset_powerset_grid -> int -> unit
val ppl_Pointset_Powerset_Grid_add_space_dimensions_and_project :
  pointset_powerset_grid -> int -> unit
val ppl_Pointset_Powerset_Grid_remove_space_dimensions :
  pointset_powerset_grid -> int list -> unit
val ppl_Pointset_Powerset_Grid_remove_higher_space_dimensions :
  pointset_powerset_grid -> int -> unit
val ppl_Pointset_Powerset_Grid_expand_space_dimension :
  pointset_powerset_grid -> int -> int -> unit
val ppl_Pointset_Powerset_Grid_fold_space_dimensions :
  pointset_powerset_grid -> int list -> int -> unit
val ppl_Pointset_Powerset_Grid_map_space_dimensions :
  pointset_powerset_grid -> (int * int) list -> unit
val ppl_Pointset_Powerset_Grid_drop_some_non_integer_points :
  pointset_powerset_grid -> complexity_class -> unit
val ppl_Pointset_Powerset_Grid_drop_some_non_integer_points_2 :
  pointset_powerset_grid ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Grid_ascii_dump : pointset_powerset_grid -> string
val ppl_Pointset_Powerset_Grid_external_memory_in_bytes :
  pointset_powerset_grid -> int
val ppl_Pointset_Powerset_Grid_total_memory_in_bytes :
  pointset_powerset_grid -> int
val ppl_Pointset_Powerset_Grid_size : pointset_powerset_grid -> int
type pointset_powerset_grid_iterator
val ppl_new_Pointset_Powerset_Grid_iterator_from_iterator :
  pointset_powerset_grid_iterator ->
  pointset_powerset_grid_iterator
```

```
val ppl_Pointset_Powerset_Grid_begin_iterator :
  pointset_powerset_grid -> pointset_powerset_grid_iterator
val ppl_Pointset_Powerset_Grid_end_iterator :
  pointset_powerset_grid -> pointset_powerset_grid_iterator
val ppl_Pointset_Powerset_Grid_iterator_equals_iterator :
  pointset_powerset_grid_iterator ->
  pointset_powerset_grid_iterator -> bool
val ppl_Pointset_Powerset_Grid_increment_iterator :
  pointset_powerset_grid_iterator -> unit
val ppl_Pointset_Powerset_Grid_decrement_iterator :
  pointset_powerset_grid_iterator -> unit
val ppl_Pointset_Powerset_Grid_get_disjunct :
  pointset_powerset_grid_iterator -> grid
val ppl_Pointset_Powerset_Grid_add_disjunct :
  pointset_powerset_grid -> grid -> unit
val ppl_Pointset_Powerset_Grid_drop_disjunct :
  pointset_powerset_grid ->
  pointset_powerset_grid_iterator -> unit
val ppl_Pointset_Powerset_Grid_drop_disjuncts :
  pointset_powerset_grid ->
  pointset_powerset_grid_iterator ->
  pointset_powerset_grid_iterator -> unit
val ppl_Pointset_Powerset_Grid_BHZ03_Grid_congruence_widening_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_BHZ03_Grid_generator_widening_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_BGP99_congruence_extrapolation_assign :
  pointset_powerset_grid ->
  pointset_powerset_grid -> int -> unit
val ppl_Pointset_Powerset_Grid_BGP99_generator_extrapolation_assign :
  pointset_powerset_grid ->
  pointset_powerset_grid -> int -> unit
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_space_dimension :
  int ->
  degenerate_element ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int8_Box :
  int8_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int16_Box :
  int16_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int32_Box :
  int32_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int64_Box :
  int64_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint8_Box :
  uint8_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint16_Box :
  uint16_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint32_Box :
```

```
  uint32_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint64_Box :
  uint64_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Z_Box :
  z_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Rational_Box :
  rational_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int8_t :
  bd_shape_int8_t -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int16_t :
  bd_shape_int16_t -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int32_t :
  bd_shape_int32_t -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int64_t :
  bd_shape_int64_t -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_mpz_class :
  bd_shape_mpz_class ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_mpq_class :
  bd_shape_mpq_class ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_C_Polyhedron :
  polyhedron -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_NNC_Polyhedron :
  polyhedron -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Grid :
  grid -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Float_Box :
  float_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_float :
  bd_shape_float -> constraints_product_c_polyhedron_grid
```

```
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_float :
  octagonal_shape_float ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Double_Box :
  double_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_double :
  bd_shape_double -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_double :
  octagonal_shape_double ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Long_Double_Box :
  long_double_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_long_double :
  bd_shape_long_double ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Constraints_Product_C_Polyhedr
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Rational_Box_with_complexity :
  rational_box ->
```

```
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int8_t_with_complexit
  bd_shape_int8_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int16_t_with_complexi
  bd_shape_int16_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int32_t_with_complexi
  bd_shape_int32_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int64_t_with_complexi
  bd_shape_int64_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_mpz_class_with_comple
  bd_shape_mpz_class ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_mpq_class_with_comple
  bd_shape_mpq_class ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int8_t_with_co
  octagonal_shape_int8_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int16_t_with_c
  octagonal_shape_int16_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int32_t_with_c
  octagonal_shape_int32_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int64_t_with_c
  octagonal_shape_int64_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_mpz_class_with
  octagonal_shape_mpz_class ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_mpq_class_with
  octagonal_shape_mpq_class ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_NNC_Polyhedron_with_complexity
  polyhedron ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Grid_with_complexity :
  grid ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_float_with_complexity
```

```
  bd_shape_float ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_float_with_com
  octagonal_shape_float ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_double_with_complexit
  bd_shape_double ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_double_with_co
  octagonal_shape_double ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Long_Double_Box_with_complexit
  long_double_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_long_double_with_comp
  bd_shape_long_double ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_long_double_wi
  octagonal_shape_long_double ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Constraints_Product_C_Polyhedr
  constraints_product_c_polyhedron_grid ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_constraints :
  constraint_system ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_congruences :
  congruence_system ->
  constraints_product_c_polyhedron_grid
val ppl_Constraints_Product_C_Polyhedron_Grid_swap :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_space_dimension :
  constraints_product_c_polyhedron_grid -> int
val ppl_Constraints_Product_C_Polyhedron_Grid_affine_dimension :
  constraints_product_c_polyhedron_grid -> int
val ppl_Constraints_Product_C_Polyhedron_Grid_relation_with_constraint :
  constraints_product_c_polyhedron_grid ->
  linear_constraint -> poly_con_relation list
val ppl_Constraints_Product_C_Polyhedron_Grid_relation_with_generator :
  constraints_product_c_polyhedron_grid ->
  linear_generator -> poly_gen_relation list
val ppl_Constraints_Product_C_Polyhedron_Grid_relation_with_congruence :
  constraints_product_c_polyhedron_grid ->
  linear_congruence -> poly_con_relation list
val ppl_Constraints_Product_C_Polyhedron_Grid_is_empty :
  constraints_product_c_polyhedron_grid -> bool
```

```
val ppl_Constraints_Product_C_Polyhedron_Grid_is_universe :
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_is_bounded :
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_is_topologically_closed :
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_is_discrete :
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_topological_closure_assign :
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_bounds_from_above :
  constraints_product_c_polyhedron_grid ->
  linear_expression -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_bounds_from_below :
  constraints_product_c_polyhedron_grid ->
  linear_expression -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_maximize :
  constraints_product_c_polyhedron_grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_C_Polyhedron_Grid_minimize :
  constraints_product_c_polyhedron_grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_C_Polyhedron_Grid_maximize_with_point :
  constraints_product_c_polyhedron_grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_C_Polyhedron_Grid_minimize_with_point :
  constraints_product_c_polyhedron_grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_C_Polyhedron_Grid_contains_Constraints_Product_C_Polyhedr
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_strictly_contains_Constraints_Product_C
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_is_disjoint_from_Constraints_Product_C_
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_equals_Constraints_Product_C_Polyhedron
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_OK :
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_add_constraint :
  constraints_product_c_polyhedron_grid ->
  linear_constraint -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_add_congruence :
  constraints_product_c_polyhedron_grid ->
  linear_congruence -> unit
```

```
val ppl_Constraints_Product_C_Polyhedron_Grid_add_constraints :
  constraints_product_c_polyhedron_grid ->
  constraint_system -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_add_congruences :
  constraints_product_c_polyhedron_grid ->
  congruence_system -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_refine_with_constraint :
  constraints_product_c_polyhedron_grid ->
  linear_constraint -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_refine_with_congruence :
  constraints_product_c_polyhedron_grid ->
  linear_congruence -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_refine_with_constraints :
  constraints_product_c_polyhedron_grid ->
  constraint_system -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_refine_with_congruences :
  constraints_product_c_polyhedron_grid ->
  congruence_system -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_intersection_assign :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_upper_bound_assign :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_difference_assign :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_concatenate_assign :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_time_elapse_assign :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_upper_bound_assign_if_exact :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_constrains :
  constraints_product_c_polyhedron_grid -> int -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_unconstrain_space_dimension :
  constraints_product_c_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_unconstrain_space_dimensions :
  constraints_product_c_polyhedron_grid -> int list -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_affine_image :
  constraints_product_c_polyhedron_grid ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_affine_preimage :
  constraints_product_c_polyhedron_grid ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_bounded_affine_image :
  constraints_product_c_polyhedron_grid ->
```

```
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_bounded_affine_preimage :
  constraints_product_c_polyhedron_grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_generalized_affine_image :
  constraints_product_c_polyhedron_grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_generalized_affine_preimage :
  constraints_product_c_polyhedron_grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_generalized_affine_image_lhs_rhs :
  constraints_product_c_polyhedron_grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_generalized_affine_preimage_lhs_rhs :
  constraints_product_c_polyhedron_grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_add_space_dimensions_and_embed :
  constraints_product_c_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_add_space_dimensions_and_project :
  constraints_product_c_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_remove_space_dimensions :
  constraints_product_c_polyhedron_grid -> int list -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_remove_higher_space_dimensions :
  constraints_product_c_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_expand_space_dimension :
  constraints_product_c_polyhedron_grid -> int -> int -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_fold_space_dimensions :
  constraints_product_c_polyhedron_grid -> int list -> int -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_map_space_dimensions :
  constraints_product_c_polyhedron_grid -> (int * int) list -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_drop_some_non_integer_points :
  constraints_product_c_polyhedron_grid ->
  complexity_class -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_drop_some_non_integer_points_2 :
  constraints_product_c_polyhedron_grid ->
  int list -> complexity_class -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_ascii_dump :
  constraints_product_c_polyhedron_grid -> string
val ppl_Constraints_Product_C_Polyhedron_Grid_external_memory_in_bytes :
  constraints_product_c_polyhedron_grid -> int
val ppl_Constraints_Product_C_Polyhedron_Grid_total_memory_in_bytes :
  constraints_product_c_polyhedron_grid -> int
val ppl_Constraints_Product_C_Polyhedron_Grid_widening_assign_with_tokens :
  constraints_product_c_polyhedron_grid ->
```

```
  constraints_product_c_polyhedron_grid -> int -> int
val ppl_Constraints_Product_C_Polyhedron_Grid_widening_assign :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_space_dimension :
  int ->
  degenerate_element ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int8_Box :
  int8_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int16_Box :
  int16_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int32_Box :
  int32_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int64_Box :
  int64_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint8_Box :
  uint8_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint16_Box :
  uint16_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint32_Box :
  uint32_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint64_Box :
  uint64_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Z_Box :
  z_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Rational_Box :
  rational_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int8_t :
  bd_shape_int8_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int16_t :
  bd_shape_int16_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int32_t :
  bd_shape_int32_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int64_t :
  bd_shape_int64_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_mpz_class :
  bd_shape_mpz_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_mpq_class :
  bd_shape_mpq_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t ->
  constraints_product_nnc_polyhedron_grid
```

```
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_C_Polyhedron :
  polyhedron -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_NNC_Polyhedron :
  polyhedron -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Grid :
  grid -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Float_Box :
  float_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_float :
  bd_shape_float -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_float :
  octagonal_shape_float ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Double_Box :
  double_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_double :
  bd_shape_double ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_double :
  octagonal_shape_double ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Long_Double_Box :
  long_double_box ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_long_double :
  bd_shape_long_double ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_long_double
  octagonal_shape_long_double ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Constraints_Product_NNC_Poly
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int8_Box_with_complexity :
  int8_box ->
```

```
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Z_Box_with_complexity :
  z_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Rational_Box_with_complexity
  rational_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int8_t_with_complex
  bd_shape_int8_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int16_t_with_comple
  bd_shape_int16_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int32_t_with_comple
  bd_shape_int32_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int64_t_with_comple
```

```
  bd_shape_int64_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_mpz_class_with_comp
  bd_shape_mpz_class ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_mpq_class_with_comp
  bd_shape_mpq_class ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int8_t_with_
  octagonal_shape_int8_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int16_t_with
  octagonal_shape_int16_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int32_t_with
  octagonal_shape_int32_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int64_t_with
  octagonal_shape_int64_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_mpz_class_wi
  octagonal_shape_mpz_class ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_mpq_class_wi
  octagonal_shape_mpq_class ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_C_Polyhedron_with_complexity
  polyhedron ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_NNC_Polyhedron_with_complexi
  polyhedron ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Grid_with_complexity :
  grid ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Float_Box_with_complexity :
  float_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
```

```
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_float_with_complexi
  bd_shape_float ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_float_with_c
  octagonal_shape_float ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Double_Box_with_complexity :
  double_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_double_with_complex
  bd_shape_double ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_double_with_
  octagonal_shape_double ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Long_Double_Box_with_complex
  long_double_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_long_double_with_co
  bd_shape_long_double ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_long_double_
  octagonal_shape_long_double ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Constraints_Product_NNC_Poly
  constraints_product_nnc_polyhedron_grid ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_constraints :
  constraint_system ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_congruences :
  congruence_system ->
  constraints_product_nnc_polyhedron_grid
val ppl_Constraints_Product_NNC_Polyhedron_Grid_swap :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_space_dimension :
  constraints_product_nnc_polyhedron_grid -> int
val ppl_Constraints_Product_NNC_Polyhedron_Grid_affine_dimension :
  constraints_product_nnc_polyhedron_grid -> int
val ppl_Constraints_Product_NNC_Polyhedron_Grid_relation_with_constraint :
  constraints_product_nnc_polyhedron_grid ->
```

```
  linear_constraint -> poly_con_relation list
val ppl_Constraints_Product_NNC_Polyhedron_Grid_relation_with_generator :
  constraints_product_nnc_polyhedron_grid ->
  linear_generator -> poly_gen_relation list
val ppl_Constraints_Product_NNC_Polyhedron_Grid_relation_with_congruence :
  constraints_product_nnc_polyhedron_grid ->
  linear_congruence -> poly_con_relation list
val ppl_Constraints_Product_NNC_Polyhedron_Grid_is_empty :
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_is_universe :
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_is_bounded :
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_is_topologically_closed :
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_is_discrete :
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_topological_closure_assign :
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_bounds_from_above :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_bounds_from_below :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_maximize :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_minimize :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_maximize_with_point :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_NNC_Polyhedron_Grid_minimize_with_point :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_NNC_Polyhedron_Grid_contains_Constraints_Product_NNC_Poly
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_strictly_contains_Constraints_Product
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_is_disjoint_from_Constraints_Product_
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_equals_Constraints_Product_NNC_Polyhe
  constraints_product_nnc_polyhedron_grid ->
```

```
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_OK :
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_add_constraint :
  constraints_product_nnc_polyhedron_grid ->
  linear_constraint -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_add_congruence :
  constraints_product_nnc_polyhedron_grid ->
  linear_congruence -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_add_constraints :
  constraints_product_nnc_polyhedron_grid ->
  constraint_system -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_add_congruences :
  constraints_product_nnc_polyhedron_grid ->
  congruence_system -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_refine_with_constraint :
  constraints_product_nnc_polyhedron_grid ->
  linear_constraint -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_refine_with_congruence :
  constraints_product_nnc_polyhedron_grid ->
  linear_congruence -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_refine_with_constraints :
  constraints_product_nnc_polyhedron_grid ->
  constraint_system -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_refine_with_congruences :
  constraints_product_nnc_polyhedron_grid ->
  congruence_system -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_intersection_assign :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_upper_bound_assign :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_difference_assign :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_concatenate_assign :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_time_elapse_assign :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_upper_bound_assign_if_exact :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_constrains :
  constraints_product_nnc_polyhedron_grid -> int -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_unconstrain_space_dimension :
  constraints_product_nnc_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_unconstrain_space_dimensions :
```

```
  constraints_product_nnc_polyhedron_grid -> int list -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_affine_image :
  constraints_product_nnc_polyhedron_grid ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_affine_preimage :
  constraints_product_nnc_polyhedron_grid ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_bounded_affine_image :
  constraints_product_nnc_polyhedron_grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_bounded_affine_preimage :
  constraints_product_nnc_polyhedron_grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_generalized_affine_image :
  constraints_product_nnc_polyhedron_grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_generalized_affine_preimage :
  constraints_product_nnc_polyhedron_grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_generalized_affine_image_lhs_rhs :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_generalized_affine_preimage_lhs_rhs :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_add_space_dimensions_and_embed :
  constraints_product_nnc_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_add_space_dimensions_and_project :
  constraints_product_nnc_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_remove_space_dimensions :
  constraints_product_nnc_polyhedron_grid -> int list -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_remove_higher_space_dimensions :
  constraints_product_nnc_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_expand_space_dimension :
  constraints_product_nnc_polyhedron_grid -> int -> int -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_fold_space_dimensions :
  constraints_product_nnc_polyhedron_grid -> int list -> int -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_map_space_dimensions :
  constraints_product_nnc_polyhedron_grid -> (int * int) list -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_drop_some_non_integer_points :
  constraints_product_nnc_polyhedron_grid ->
  complexity_class -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_drop_some_non_integer_points_2 :
  constraints_product_nnc_polyhedron_grid ->
```

```
  int list -> complexity_class -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_ascii_dump :
  constraints_product_nnc_polyhedron_grid -> string
val ppl_Constraints_Product_NNC_Polyhedron_Grid_external_memory_in_bytes :
  constraints_product_nnc_polyhedron_grid -> int
val ppl_Constraints_Product_NNC_Polyhedron_Grid_total_memory_in_bytes :
  constraints_product_nnc_polyhedron_grid -> int
val ppl_Constraints_Product_NNC_Polyhedron_Grid_widening_assign_with_tokens :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> int -> int
val ppl_Constraints_Product_NNC_Polyhedron_Grid_widening_assign :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_space_dimension :
  int ->
  degenerate_element ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int8_Box :
  int8_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int16_Box :
  int16_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int32_Box :
  int32_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int64_Box :
  int64_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint8_Box :
  uint8_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint16_Box :
  uint16_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint32_Box :
  uint32_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint64_Box :
  uint64_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Z_Box :
  z_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Rational_Box :
  rational_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int8_t :
  bd_shape_int8_t -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int16_t :
  bd_shape_int16_t -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int32_t :
  bd_shape_int32_t -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int64_t :
  bd_shape_int64_t -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_mpz_class :
  bd_shape_mpz_class ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_mpq_class :
```

```
  bd_shape_mpq_class ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_C_Polyhedron :
  polyhedron -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_NNC_Polyhedron :
  polyhedron -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grid :
  grid -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Float_Box :
  float_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_float :
  bd_shape_float -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_float :
  octagonal_shape_float ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Double_Box :
  double_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_double :
  bd_shape_double -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_double :
  octagonal_shape_double ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Long_Double_Box :
  long_double_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_long_double :
  bd_shape_long_double ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Constraints_Product_Grid_C_Pol
```

```
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int8_t_with_complexit
  bd_shape_int8_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int16_t_with_complexi
  bd_shape_int16_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int32_t_with_complexi
  bd_shape_int32_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int64_t_with_complexi
  bd_shape_int64_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_mpz_class_with_comple
  bd_shape_mpz_class ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_mpq_class_with_comple
  bd_shape_mpq_class ->
  complexity_class -> constraints_product_grid_c_polyhedron
```

```
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int8_t_with_co
  octagonal_shape_int8_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int16_t_with_c
  octagonal_shape_int16_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int32_t_with_c
  octagonal_shape_int32_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int64_t_with_c
  octagonal_shape_int64_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_mpz_class_with
  octagonal_shape_mpz_class ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_mpq_class_with
  octagonal_shape_mpq_class ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_NNC_Polyhedron_with_complexity
  polyhedron ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grid_with_complexity :
  grid ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_float_with_complexity
  bd_shape_float ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_float_with_com
  octagonal_shape_float ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_double_with_complexit
  bd_shape_double ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_double_with_co
  octagonal_shape_double ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Long_Double_Box_with_complexit
  long_double_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_long_double_with_comp
  bd_shape_long_double ->
```

```
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_long_double_wi
  octagonal_shape_long_double ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Constraints_Product_Grid_C_Pol
  constraints_product_grid_c_polyhedron ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_constraints :
  constraint_system ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_congruences :
  congruence_system ->
  constraints_product_grid_c_polyhedron
val ppl_Constraints_Product_Grid_C_Polyhedron_swap :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_space_dimension :
  constraints_product_grid_c_polyhedron -> int
val ppl_Constraints_Product_Grid_C_Polyhedron_affine_dimension :
  constraints_product_grid_c_polyhedron -> int
val ppl_Constraints_Product_Grid_C_Polyhedron_relation_with_constraint :
  constraints_product_grid_c_polyhedron ->
  linear_constraint -> poly_con_relation list
val ppl_Constraints_Product_Grid_C_Polyhedron_relation_with_generator :
  constraints_product_grid_c_polyhedron ->
  linear_generator -> poly_gen_relation list
val ppl_Constraints_Product_Grid_C_Polyhedron_relation_with_congruence :
  constraints_product_grid_c_polyhedron ->
  linear_congruence -> poly_con_relation list
val ppl_Constraints_Product_Grid_C_Polyhedron_is_empty :
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_is_universe :
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_is_bounded :
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_is_topologically_closed :
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_is_discrete :
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_topological_closure_assign :
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_bounds_from_above :
  constraints_product_grid_c_polyhedron ->
  linear_expression -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_bounds_from_below :
  constraints_product_grid_c_polyhedron ->
  linear_expression -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_maximize :
  constraints_product_grid_c_polyhedron ->
```

```
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_Grid_C_Polyhedron_minimize :
  constraints_product_grid_c_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_Grid_C_Polyhedron_maximize_with_point :
  constraints_product_grid_c_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_Grid_C_Polyhedron_minimize_with_point :
  constraints_product_grid_c_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_Grid_C_Polyhedron_contains_Constraints_Product_Grid_C_Pol
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_strictly_contains_Constraints_Product_G
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_is_disjoint_from_Constraints_Product_Gr
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_equals_Constraints_Product_Grid_C_Polyh
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_OK :
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_add_constraint :
  constraints_product_grid_c_polyhedron ->
  linear_constraint -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_add_congruence :
  constraints_product_grid_c_polyhedron ->
  linear_congruence -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_add_constraints :
  constraints_product_grid_c_polyhedron ->
  constraint_system -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_add_congruences :
  constraints_product_grid_c_polyhedron ->
  congruence_system -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_refine_with_constraint :
  constraints_product_grid_c_polyhedron ->
  linear_constraint -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_refine_with_congruence :
  constraints_product_grid_c_polyhedron ->
  linear_congruence -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_refine_with_constraints :
  constraints_product_grid_c_polyhedron ->
  constraint_system -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_refine_with_congruences :
  constraints_product_grid_c_polyhedron ->
  congruence_system -> unit
```

```
val ppl_Constraints_Product_Grid_C_Polyhedron_intersection_assign :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_upper_bound_assign :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_difference_assign :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_concatenate_assign :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_time_elapse_assign :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_upper_bound_assign_if_exact :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_constrains :
  constraints_product_grid_c_polyhedron -> int -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_unconstrain_space_dimension :
  constraints_product_grid_c_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_unconstrain_space_dimensions :
  constraints_product_grid_c_polyhedron -> int list -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_affine_image :
  constraints_product_grid_c_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_affine_preimage :
  constraints_product_grid_c_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_bounded_affine_image :
  constraints_product_grid_c_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_bounded_affine_preimage :
  constraints_product_grid_c_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_generalized_affine_image :
  constraints_product_grid_c_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_generalized_affine_preimage :
  constraints_product_grid_c_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_generalized_affine_image_lhs_rhs :
  constraints_product_grid_c_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
```

```
val ppl_Constraints_Product_Grid_C_Polyhedron_generalized_affine_preimage_lhs_rhs :
  constraints_product_grid_c_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_add_space_dimensions_and_embed :
  constraints_product_grid_c_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_add_space_dimensions_and_project :
  constraints_product_grid_c_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_remove_space_dimensions :
  constraints_product_grid_c_polyhedron -> int list -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_remove_higher_space_dimensions :
  constraints_product_grid_c_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_expand_space_dimension :
  constraints_product_grid_c_polyhedron -> int -> int -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_fold_space_dimensions :
  constraints_product_grid_c_polyhedron -> int list -> int -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_map_space_dimensions :
  constraints_product_grid_c_polyhedron -> (int * int) list -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_drop_some_non_integer_points :
  constraints_product_grid_c_polyhedron ->
  complexity_class -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_drop_some_non_integer_points_2 :
  constraints_product_grid_c_polyhedron ->
  int list -> complexity_class -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_ascii_dump :
  constraints_product_grid_c_polyhedron -> string
val ppl_Constraints_Product_Grid_C_Polyhedron_external_memory_in_bytes :
  constraints_product_grid_c_polyhedron -> int
val ppl_Constraints_Product_Grid_C_Polyhedron_total_memory_in_bytes :
  constraints_product_grid_c_polyhedron -> int
val ppl_Constraints_Product_Grid_C_Polyhedron_widening_assign_with_tokens :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> int -> int
val ppl_Constraints_Product_Grid_C_Polyhedron_widening_assign :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_space_dimension :
  int ->
  degenerate_element ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int8_Box :
  int8_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int16_Box :
  int16_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int32_Box :
  int32_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int64_Box :
  int64_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint8_Box :
```

```
  uint8_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint16_Box :
  uint16_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint32_Box :
  uint32_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint64_Box :
  uint64_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Z_Box :
  z_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Rational_Box :
  rational_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int8_t :
  bd_shape_int8_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int16_t :
  bd_shape_int16_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int32_t :
  bd_shape_int32_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int64_t :
  bd_shape_int64_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_mpz_class :
  bd_shape_mpz_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_mpq_class :
  bd_shape_mpq_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_C_Polyhedron :
  polyhedron -> constraints_product_grid_nnc_polyhedron
```

```
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_NNC_Polyhedron :
  polyhedron -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Grid :
  grid -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Float_Box :
  float_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_float :
  bd_shape_float -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_float :
  octagonal_shape_float ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Double_Box :
  double_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_double :
  bd_shape_double ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_double :
  octagonal_shape_double ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Long_Double_Box :
  long_double_box ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_long_double :
  bd_shape_long_double ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_long_double
  octagonal_shape_long_double ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_Grid_NNC
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class ->
```

```
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Z_Box_with_complexity :
  z_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Rational_Box_with_complexity
  rational_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int8_t_with_complex
  bd_shape_int8_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int16_t_with_comple
  bd_shape_int16_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int32_t_with_comple
  bd_shape_int32_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int64_t_with_comple
  bd_shape_int64_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_mpz_class_with_comp
  bd_shape_mpz_class ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_mpq_class_with_comp
  bd_shape_mpq_class ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int8_t_with_
  octagonal_shape_int8_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int16_t_with
  octagonal_shape_int16_t ->
```

```
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int32_t_with
  octagonal_shape_int32_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int64_t_with
  octagonal_shape_int64_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_mpz_class_wi
  octagonal_shape_mpz_class ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_mpq_class_wi
  octagonal_shape_mpq_class ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_C_Polyhedron_with_complexity
  polyhedron ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_NNC_Polyhedron_with_complexi
  polyhedron ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Grid_with_complexity :
  grid ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Float_Box_with_complexity :
  float_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_float_with_complexi
  bd_shape_float ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_float_with_c
  octagonal_shape_float ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Double_Box_with_complexity :
  double_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_double_with_complex
  bd_shape_double ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_double_with_
```

```
  octagonal_shape_double ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Long_Double_Box_with_complex
  long_double_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_long_double_with_co
  bd_shape_long_double ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_long_double_
  octagonal_shape_long_double ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_Grid_NNC
  constraints_product_grid_nnc_polyhedron ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_constraints :
  constraint_system ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_congruences :
  congruence_system ->
  constraints_product_grid_nnc_polyhedron
val ppl_Constraints_Product_Grid_NNC_Polyhedron_swap :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_space_dimension :
  constraints_product_grid_nnc_polyhedron -> int
val ppl_Constraints_Product_Grid_NNC_Polyhedron_affine_dimension :
  constraints_product_grid_nnc_polyhedron -> int
val ppl_Constraints_Product_Grid_NNC_Polyhedron_relation_with_constraint :
  constraints_product_grid_nnc_polyhedron ->
  linear_constraint -> poly_con_relation list
val ppl_Constraints_Product_Grid_NNC_Polyhedron_relation_with_generator :
  constraints_product_grid_nnc_polyhedron ->
  linear_generator -> poly_gen_relation list
val ppl_Constraints_Product_Grid_NNC_Polyhedron_relation_with_congruence :
  constraints_product_grid_nnc_polyhedron ->
  linear_congruence -> poly_con_relation list
val ppl_Constraints_Product_Grid_NNC_Polyhedron_is_empty :
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_is_universe :
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_is_bounded :
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_is_topologically_closed :
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_is_discrete :
```

```
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_topological_closure_assign :
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_bounds_from_above :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_bounds_from_below :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_maximize :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_minimize :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_maximize_with_point :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_Grid_NNC_Polyhedron_minimize_with_point :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_Grid_NNC_Polyhedron_contains_Constraints_Product_Grid_NNC
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_strictly_contains_Constraints_Product
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_is_disjoint_from_Constraints_Product_
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_equals_Constraints_Product_Grid_NNC_P
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_OK :
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_add_constraint :
  constraints_product_grid_nnc_polyhedron ->
  linear_constraint -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_add_congruence :
  constraints_product_grid_nnc_polyhedron ->
  linear_congruence -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_add_constraints :
  constraints_product_grid_nnc_polyhedron ->
  constraint_system -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_add_congruences :
  constraints_product_grid_nnc_polyhedron ->
  congruence_system -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_refine_with_constraint :
```

```
  constraints_product_grid_nnc_polyhedron ->
  linear_constraint -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_refine_with_congruence :
  constraints_product_grid_nnc_polyhedron ->
  linear_congruence -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_refine_with_constraints :
  constraints_product_grid_nnc_polyhedron ->
  constraint_system -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_refine_with_congruences :
  constraints_product_grid_nnc_polyhedron ->
  congruence_system -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_intersection_assign :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_upper_bound_assign :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_difference_assign :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_concatenate_assign :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_time_elapse_assign :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_upper_bound_assign_if_exact :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_constrains :
  constraints_product_grid_nnc_polyhedron -> int -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_unconstrain_space_dimension :
  constraints_product_grid_nnc_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_unconstrain_space_dimensions :
  constraints_product_grid_nnc_polyhedron -> int list -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_affine_image :
  constraints_product_grid_nnc_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_affine_preimage :
  constraints_product_grid_nnc_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_bounded_affine_image :
  constraints_product_grid_nnc_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_bounded_affine_preimage :
  constraints_product_grid_nnc_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_generalized_affine_image :
```

```
  constraints_product_grid_nnc_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_generalized_affine_preimage :
  constraints_product_grid_nnc_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_generalized_affine_image_lhs_rhs :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_generalized_affine_preimage_lhs_rhs :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_add_space_dimensions_and_embed :
  constraints_product_grid_nnc_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_add_space_dimensions_and_project :
  constraints_product_grid_nnc_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_remove_space_dimensions :
  constraints_product_grid_nnc_polyhedron -> int list -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_remove_higher_space_dimensions :
  constraints_product_grid_nnc_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_expand_space_dimension :
  constraints_product_grid_nnc_polyhedron -> int -> int -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_fold_space_dimensions :
  constraints_product_grid_nnc_polyhedron -> int list -> int -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_map_space_dimensions :
  constraints_product_grid_nnc_polyhedron -> (int * int) list -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_drop_some_non_integer_points :
  constraints_product_grid_nnc_polyhedron ->
  complexity_class -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_drop_some_non_integer_points_2 :
  constraints_product_grid_nnc_polyhedron ->
  int list -> complexity_class -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_ascii_dump :
  constraints_product_grid_nnc_polyhedron -> string
val ppl_Constraints_Product_Grid_NNC_Polyhedron_external_memory_in_bytes :
  constraints_product_grid_nnc_polyhedron -> int
val ppl_Constraints_Product_Grid_NNC_Polyhedron_total_memory_in_bytes :
  constraints_product_grid_nnc_polyhedron -> int
val ppl_Constraints_Product_Grid_NNC_Polyhedron_widening_assign_with_tokens :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> int -> int
val ppl_Constraints_Product_Grid_NNC_Polyhedron_widening_assign :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_new_Float_Box_from_space_dimension :
  int -> degenerate_element -> float_box
```

```
val ppl_new_Float_Box_from_Int8_Box : int8_box -> float_box
val ppl_new_Float_Box_from_Int16_Box : int16_box -> float_box
val ppl_new_Float_Box_from_Int32_Box : int32_box -> float_box
val ppl_new_Float_Box_from_Int64_Box : int64_box -> float_box
val ppl_new_Float_Box_from_Uint8_Box : uint8_box -> float_box
val ppl_new_Float_Box_from_Uint16_Box : uint16_box -> float_box
val ppl_new_Float_Box_from_Uint32_Box : uint32_box -> float_box
val ppl_new_Float_Box_from_Uint64_Box : uint64_box -> float_box
val ppl_new_Float_Box_from_Z_Box : z_box -> float_box
val ppl_new_Float_Box_from_Rational_Box : rational_box -> float_box
val ppl_new_Float_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> float_box
val ppl_new_Float_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> float_box
val ppl_new_Float_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> float_box
val ppl_new_Float_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> float_box
val ppl_new_Float_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> float_box
val ppl_new_Float_Box_from_C_Polyhedron : polyhedron -> float_box
val ppl_new_Float_Box_from_NNC_Polyhedron : polyhedron -> float_box
val ppl_new_Float_Box_from_Grid : grid -> float_box
val ppl_new_Float_Box_from_Float_Box : float_box -> float_box
val ppl_new_Float_Box_from_BD_Shape_float : bd_shape_float -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> float_box
val ppl_new_Float_Box_from_Double_Box : double_box -> float_box
val ppl_new_Float_Box_from_BD_Shape_double : bd_shape_double -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> float_box
val ppl_new_Float_Box_from_Long_Double_Box : long_double_box -> float_box
val ppl_new_Float_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> float_box
```

```
val ppl_new_Float_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
```

```
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> float_box
val ppl_new_Float_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> float_box
val ppl_new_Float_Box_from_Grid_with_complexity :
  grid -> complexity_class -> float_box
val ppl_new_Float_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_constraints : constraint_system -> float_box
val ppl_new_Float_Box_from_congruences : congruence_system -> float_box
val ppl_new_Float_Box_from_generators : generator_system -> float_box
val ppl_Float_Box_swap : float_box -> float_box -> unit
val ppl_Float_Box_space_dimension : float_box -> int
val ppl_Float_Box_affine_dimension : float_box -> int
val ppl_Float_Box_relation_with_constraint :
  float_box ->
  linear_constraint -> poly_con_relation list
val ppl_Float_Box_relation_with_generator :
  float_box ->
  linear_generator -> poly_gen_relation list
```

```
val ppl_Float_Box_relation_with_congruence :
  float_box ->
  linear_congruence -> poly_con_relation list
val ppl_Float_Box_get_constraints : float_box -> constraint_system
val ppl_Float_Box_get_congruences : float_box -> congruence_system
val ppl_Float_Box_get_minimized_constraints : float_box -> constraint_system
val ppl_Float_Box_get_minimized_congruences : float_box -> congruence_system
val ppl_Float_Box_is_empty : float_box -> bool
val ppl_Float_Box_is_universe : float_box -> bool
val ppl_Float_Box_is_bounded : float_box -> bool
val ppl_Float_Box_contains_integer_point : float_box -> bool
val ppl_Float_Box_is_topologically_closed : float_box -> bool
val ppl_Float_Box_is_discrete : float_box -> bool
val ppl_Float_Box_topological_closure_assign : float_box -> unit
val ppl_Float_Box_bounds_from_above : float_box -> linear_expression -> bool
val ppl_Float_Box_bounds_from_below : float_box -> linear_expression -> bool
val ppl_Float_Box_maximize :
  float_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Float_Box_minimize :
  float_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Float_Box_maximize_with_point :
  float_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Float_Box_minimize_with_point :
  float_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Float_Box_frequency :
  float_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Float_Box_contains_Float_Box : float_box -> float_box -> bool
val ppl_Float_Box_strictly_contains_Float_Box :
  float_box -> float_box -> bool
val ppl_Float_Box_is_disjoint_from_Float_Box : float_box -> float_box -> bool
val ppl_Float_Box_equals_Float_Box : float_box -> float_box -> bool
val ppl_Float_Box_OK : float_box -> bool
val ppl_Float_Box_add_constraint : float_box -> linear_constraint -> unit
val ppl_Float_Box_add_congruence : float_box -> linear_congruence -> unit
val ppl_Float_Box_add_constraints : float_box -> constraint_system -> unit
val ppl_Float_Box_add_congruences : float_box -> congruence_system -> unit
val ppl_Float_Box_refine_with_constraint :
  float_box -> linear_constraint -> unit
val ppl_Float_Box_refine_with_congruence :
  float_box -> linear_congruence -> unit
```

```
val ppl_Float_Box_refine_with_constraints :
  float_box -> constraint_system -> unit
val ppl_Float_Box_refine_with_congruences :
  float_box -> congruence_system -> unit
val ppl_Float_Box_intersection_assign : float_box -> float_box -> unit
val ppl_Float_Box_upper_bound_assign : float_box -> float_box -> unit
val ppl_Float_Box_difference_assign : float_box -> float_box -> unit
val ppl_Float_Box_concatenate_assign : float_box -> float_box -> unit
val ppl_Float_Box_time_elapse_assign : float_box -> float_box -> unit
val ppl_Float_Box_upper_bound_assign_if_exact :
  float_box -> float_box -> bool
val ppl_Float_Box_simplify_using_context_assign :
  float_box -> float_box -> bool
val ppl_Float_Box_constrains : float_box -> int -> bool
val ppl_Float_Box_unconstrain_space_dimension : float_box -> int -> unit
val ppl_Float_Box_unconstrain_space_dimensions :
  float_box -> int list -> unit
val ppl_Float_Box_affine_image :
  float_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Float_Box_affine_preimage :
  float_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Float_Box_bounded_affine_image :
  float_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Float_Box_bounded_affine_preimage :
  float_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Float_Box_generalized_affine_image :
  float_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Float_Box_generalized_affine_preimage :
  float_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Float_Box_generalized_affine_image_lhs_rhs :
  float_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Float_Box_generalized_affine_preimage_lhs_rhs :
  float_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Float_Box_add_space_dimensions_and_embed : float_box -> int -> unit
val ppl_Float_Box_add_space_dimensions_and_project : float_box -> int -> unit
val ppl_Float_Box_remove_space_dimensions : float_box -> int list -> unit
```

```
val ppl_Float_Box_remove_higher_space_dimensions : float_box -> int -> unit
val ppl_Float_Box_expand_space_dimension : float_box -> int -> int -> unit
val ppl_Float_Box_fold_space_dimensions :
  float_box -> int list -> int -> unit
val ppl_Float_Box_map_space_dimensions :
  float_box -> (int * int) list -> unit
val ppl_Float_Box_drop_some_non_integer_points :
  float_box -> complexity_class -> unit
val ppl_Float_Box_drop_some_non_integer_points_2 :
  float_box -> int list -> complexity_class -> unit
val ppl_Float_Box_ascii_dump : float_box -> string
val ppl_Float_Box_external_memory_in_bytes : float_box -> int
val ppl_Float_Box_total_memory_in_bytes : float_box -> int
val ppl_Float_Box_CC76_widening_assign_with_tokens :
  float_box -> float_box -> int -> int
val ppl_Float_Box_CC76_widening_assign : float_box -> float_box -> unit
val ppl_Float_Box_widening_assign_with_tokens :
  float_box -> float_box -> int -> int
val ppl_Float_Box_widening_assign : float_box -> float_box -> unit
val ppl_Float_Box_limited_CC76_extrapolation_assign_with_tokens :
  float_box ->
  float_box -> constraint_system -> int -> int
val ppl_Float_Box_limited_CC76_extrapolation_assign :
  float_box ->
  float_box -> constraint_system -> unit
val ppl_Float_Box_linear_partition :
  float_box ->
  float_box ->
  float_box * pointset_powerset_nnc_polyhedron
val ppl_Float_Box_wrap_assign :
  float_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Float_Box : float_box -> bool
val ppl_termination_test_PR_Float_Box : float_box -> bool
val ppl_one_affine_ranking_function_MS_Float_Box :
  float_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Float_Box :
  float_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Float_Box : float_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Float_Box : float_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Float_Box :
  float_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Float_Box_2 : float_box -> float_box -> bool
val ppl_termination_test_PR_Float_Box_2 : float_box -> float_box -> bool
```

```
val ppl_one_affine_ranking_function_MS_Float_Box_2 :
  float_box ->
  float_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Float_Box_2 :
  float_box ->
  float_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Float_Box_2 :
  float_box -> float_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Float_Box_2 :
  float_box -> float_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Float_Box_2 :
  float_box ->
  float_box -> polyhedron * polyhedron
val ppl_new_BD_Shape_float_from_space_dimension :
  int -> degenerate_element -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int8_Box : int8_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int16_Box : int16_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int32_Box : int32_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int64_Box : int64_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint8_Box : uint8_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint16_Box : uint16_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint32_Box : uint32_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint64_Box : uint64_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Z_Box : z_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Rational_Box : rational_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_float
```

```
val ppl_new_BD_Shape_float_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_C_Polyhedron : polyhedron -> bd_shape_float
val ppl_new_BD_Shape_float_from_NNC_Polyhedron : polyhedron -> bd_shape_float
val ppl_new_BD_Shape_float_from_Grid : grid -> bd_shape_float
val ppl_new_BD_Shape_float_from_Float_Box : float_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_float :
  bd_shape_float -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_float
val ppl_new_BD_Shape_float_from_Double_Box : double_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_double :
  bd_shape_double -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_float
val ppl_new_BD_Shape_float_from_Long_Double_Box :
  long_double_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_float
```

```
val ppl_new_BD_Shape_float_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Float_Box_with_complexity :
  float_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Double_Box_with_complexity :
```

```
  double_box ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_constraints :
  constraint_system -> bd_shape_float
val ppl_new_BD_Shape_float_from_congruences :
  congruence_system -> bd_shape_float
val ppl_new_BD_Shape_float_from_generators :
  generator_system -> bd_shape_float
val ppl_BD_Shape_float_swap : bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_space_dimension : bd_shape_float -> int
val ppl_BD_Shape_float_affine_dimension : bd_shape_float -> int
val ppl_BD_Shape_float_relation_with_constraint :
  bd_shape_float ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_float_relation_with_generator :
  bd_shape_float ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_float_relation_with_congruence :
  bd_shape_float ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_float_get_constraints : bd_shape_float -> constraint_system
val ppl_BD_Shape_float_get_congruences : bd_shape_float -> congruence_system
val ppl_BD_Shape_float_get_minimized_constraints :
  bd_shape_float -> constraint_system
val ppl_BD_Shape_float_get_minimized_congruences :
  bd_shape_float -> congruence_system
val ppl_BD_Shape_float_is_empty : bd_shape_float -> bool
val ppl_BD_Shape_float_is_universe : bd_shape_float -> bool
val ppl_BD_Shape_float_is_bounded : bd_shape_float -> bool
val ppl_BD_Shape_float_contains_integer_point : bd_shape_float -> bool
val ppl_BD_Shape_float_is_topologically_closed : bd_shape_float -> bool
val ppl_BD_Shape_float_is_discrete : bd_shape_float -> bool
val ppl_BD_Shape_float_topological_closure_assign : bd_shape_float -> unit
```

```
val ppl_BD_Shape_float_bounds_from_above :
  bd_shape_float -> linear_expression -> bool
val ppl_BD_Shape_float_bounds_from_below :
  bd_shape_float -> linear_expression -> bool
val ppl_BD_Shape_float_maximize :
  bd_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_float_minimize :
  bd_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_float_maximize_with_point :
  bd_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_float_minimize_with_point :
  bd_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_float_frequency :
  bd_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_float_contains_BD_Shape_float :
  bd_shape_float -> bd_shape_float -> bool
val ppl_BD_Shape_float_strictly_contains_BD_Shape_float :
  bd_shape_float -> bd_shape_float -> bool
val ppl_BD_Shape_float_is_disjoint_from_BD_Shape_float :
  bd_shape_float -> bd_shape_float -> bool
val ppl_BD_Shape_float_equals_BD_Shape_float :
  bd_shape_float -> bd_shape_float -> bool
val ppl_BD_Shape_float_OK : bd_shape_float -> bool
val ppl_BD_Shape_float_add_constraint :
  bd_shape_float -> linear_constraint -> unit
val ppl_BD_Shape_float_add_congruence :
  bd_shape_float -> linear_congruence -> unit
val ppl_BD_Shape_float_add_constraints :
  bd_shape_float -> constraint_system -> unit
val ppl_BD_Shape_float_add_congruences :
  bd_shape_float -> congruence_system -> unit
val ppl_BD_Shape_float_refine_with_constraint :
  bd_shape_float -> linear_constraint -> unit
val ppl_BD_Shape_float_refine_with_congruence :
  bd_shape_float -> linear_congruence -> unit
val ppl_BD_Shape_float_refine_with_constraints :
  bd_shape_float -> constraint_system -> unit
val ppl_BD_Shape_float_refine_with_congruences :
  bd_shape_float -> congruence_system -> unit
val ppl_BD_Shape_float_intersection_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_upper_bound_assign :
```

```
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_difference_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_concatenate_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_time_elapse_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_upper_bound_assign_if_exact :
  bd_shape_float -> bd_shape_float -> bool
val ppl_BD_Shape_float_simplify_using_context_assign :
  bd_shape_float -> bd_shape_float -> bool
val ppl_BD_Shape_float_constrains : bd_shape_float -> int -> bool
val ppl_BD_Shape_float_unconstrain_space_dimension :
  bd_shape_float -> int -> unit
val ppl_BD_Shape_float_unconstrain_space_dimensions :
  bd_shape_float -> int list -> unit
val ppl_BD_Shape_float_affine_image :
  bd_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_float_affine_preimage :
  bd_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_float_bounded_affine_image :
  bd_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_float_bounded_affine_preimage :
  bd_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_float_generalized_affine_image :
  bd_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_float_generalized_affine_preimage :
  bd_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_float_generalized_affine_image_lhs_rhs :
  bd_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_float_generalized_affine_preimage_lhs_rhs :
  bd_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_float_add_space_dimensions_and_embed :
  bd_shape_float -> int -> unit
val ppl_BD_Shape_float_add_space_dimensions_and_project :
  bd_shape_float -> int -> unit
```

```
val ppl_BD_Shape_float_remove_space_dimensions :
  bd_shape_float -> int list -> unit
val ppl_BD_Shape_float_remove_higher_space_dimensions :
  bd_shape_float -> int -> unit
val ppl_BD_Shape_float_expand_space_dimension :
  bd_shape_float -> int -> int -> unit
val ppl_BD_Shape_float_fold_space_dimensions :
  bd_shape_float -> int list -> int -> unit
val ppl_BD_Shape_float_map_space_dimensions :
  bd_shape_float -> (int * int) list -> unit
val ppl_BD_Shape_float_drop_some_non_integer_points :
  bd_shape_float -> complexity_class -> unit
val ppl_BD_Shape_float_drop_some_non_integer_points_2 :
  bd_shape_float -> int list -> complexity_class -> unit
val ppl_BD_Shape_float_ascii_dump : bd_shape_float -> string
val ppl_BD_Shape_float_external_memory_in_bytes : bd_shape_float -> int
val ppl_BD_Shape_float_total_memory_in_bytes : bd_shape_float -> int
val ppl_BD_Shape_float_BHMZ05_widening_assign_with_tokens :
  bd_shape_float -> bd_shape_float -> int -> int
val ppl_BD_Shape_float_H79_widening_assign_with_tokens :
  bd_shape_float -> bd_shape_float -> int -> int
val ppl_BD_Shape_float_BHMZ05_widening_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_H79_widening_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_widening_assign_with_tokens :
  bd_shape_float -> bd_shape_float -> int -> int
val ppl_BD_Shape_float_widening_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_float ->
  bd_shape_float -> constraint_system -> int -> int
val ppl_BD_Shape_float_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_float ->
  bd_shape_float -> constraint_system -> int -> int
val ppl_BD_Shape_float_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_float ->
  bd_shape_float -> constraint_system -> int -> int
val ppl_BD_Shape_float_limited_BHMZ05_extrapolation_assign :
  bd_shape_float ->
  bd_shape_float -> constraint_system -> unit
val ppl_BD_Shape_float_limited_H79_extrapolation_assign :
  bd_shape_float ->
  bd_shape_float -> constraint_system -> unit
val ppl_BD_Shape_float_limited_CC76_extrapolation_assign :
  bd_shape_float ->
  bd_shape_float -> constraint_system -> unit
val ppl_BD_Shape_float_CC76_extrapolation_assign_with_tokens :
  bd_shape_float -> bd_shape_float -> int -> int
```

```
val ppl_BD_Shape_float_CC76_extrapolation_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_CC76_narrowing_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_linear_partition :
  bd_shape_float ->
  bd_shape_float ->
  bd_shape_float * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_float_wrap_assign :
  bd_shape_float ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_float : bd_shape_float -> bool
val ppl_termination_test_PR_BD_Shape_float : bd_shape_float -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_float :
  bd_shape_float -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_float :
  bd_shape_float -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_float :
  bd_shape_float -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_float :
  bd_shape_float -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_float :
  bd_shape_float -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_float_2 :
  bd_shape_float -> bd_shape_float -> bool
val ppl_termination_test_PR_BD_Shape_float_2 :
  bd_shape_float -> bd_shape_float -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_float_2 :
  bd_shape_float ->
  bd_shape_float -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_float_2 :
  bd_shape_float ->
  bd_shape_float -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_float_2 :
  bd_shape_float -> bd_shape_float -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_float_2 :
  bd_shape_float -> bd_shape_float -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_float_2 :
  bd_shape_float ->
  bd_shape_float -> polyhedron * polyhedron
val ppl_new_Octagonal_Shape_float_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int8_Box :
  int8_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int16_Box :
```

```
  int16_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int32_Box :
  int32_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int64_Box :
  int64_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint8_Box :
  uint8_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint16_Box :
  uint16_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint32_Box :
  uint32_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint64_Box :
  uint64_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Z_Box : z_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Rational_Box :
  rational_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_C_Polyhedron :
  polyhedron -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Grid : grid -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Float_Box :
  float_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_float :
```

```
  bd_shape_float -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Double_Box :
  double_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Long_Double_Box :
  long_double_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int16_t_with_complexity :
```

```
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_float
```

```
val ppl_new_Octagonal_Shape_float_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_constraints :
  constraint_system -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_congruences :
  congruence_system -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_generators :
  generator_system -> octagonal_shape_float
val ppl_Octagonal_Shape_float_swap :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_space_dimension : octagonal_shape_float -> int
val ppl_Octagonal_Shape_float_affine_dimension : octagonal_shape_float -> int
val ppl_Octagonal_Shape_float_relation_with_constraint :
  octagonal_shape_float ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_float_relation_with_generator :
  octagonal_shape_float ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_float_relation_with_congruence :
  octagonal_shape_float ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_float_get_constraints :
  octagonal_shape_float -> constraint_system
val ppl_Octagonal_Shape_float_get_congruences :
  octagonal_shape_float -> congruence_system
val ppl_Octagonal_Shape_float_get_minimized_constraints :
  octagonal_shape_float -> constraint_system
val ppl_Octagonal_Shape_float_get_minimized_congruences :
  octagonal_shape_float -> congruence_system
val ppl_Octagonal_Shape_float_is_empty : octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_is_universe : octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_is_bounded : octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_contains_integer_point :
```

```
  octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_is_topologically_closed :
  octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_is_discrete : octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_topological_closure_assign :
  octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_bounds_from_above :
  octagonal_shape_float -> linear_expression -> bool
val ppl_Octagonal_Shape_float_bounds_from_below :
  octagonal_shape_float -> linear_expression -> bool
val ppl_Octagonal_Shape_float_maximize :
  octagonal_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_float_minimize :
  octagonal_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_float_maximize_with_point :
  octagonal_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_float_minimize_with_point :
  octagonal_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_float_frequency :
  octagonal_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_float_contains_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_strictly_contains_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_is_disjoint_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_equals_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_OK : octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_add_constraint :
  octagonal_shape_float -> linear_constraint -> unit
val ppl_Octagonal_Shape_float_add_congruence :
  octagonal_shape_float -> linear_congruence -> unit
val ppl_Octagonal_Shape_float_add_constraints :
  octagonal_shape_float -> constraint_system -> unit
val ppl_Octagonal_Shape_float_add_congruences :
  octagonal_shape_float -> congruence_system -> unit
val ppl_Octagonal_Shape_float_refine_with_constraint :
  octagonal_shape_float -> linear_constraint -> unit
val ppl_Octagonal_Shape_float_refine_with_congruence :
  octagonal_shape_float -> linear_congruence -> unit
val ppl_Octagonal_Shape_float_refine_with_constraints :
```

```
  octagonal_shape_float -> constraint_system -> unit
val ppl_Octagonal_Shape_float_refine_with_congruences :
  octagonal_shape_float -> congruence_system -> unit
val ppl_Octagonal_Shape_float_intersection_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_upper_bound_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_difference_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_concatenate_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_time_elapse_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_upper_bound_assign_if_exact :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_simplify_using_context_assign :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_constrains :
  octagonal_shape_float -> int -> bool
val ppl_Octagonal_Shape_float_unconstrain_space_dimension :
  octagonal_shape_float -> int -> unit
val ppl_Octagonal_Shape_float_unconstrain_space_dimensions :
  octagonal_shape_float -> int list -> unit
val ppl_Octagonal_Shape_float_affine_image :
  octagonal_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_float_affine_preimage :
  octagonal_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_float_bounded_affine_image :
  octagonal_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_float_bounded_affine_preimage :
  octagonal_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_float_generalized_affine_image :
  octagonal_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_float_generalized_affine_preimage :
  octagonal_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_float_generalized_affine_image_lhs_rhs :
  octagonal_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
```

```
val ppl_Octagonal_Shape_float_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_float_add_space_dimensions_and_embed :
  octagonal_shape_float -> int -> unit
val ppl_Octagonal_Shape_float_add_space_dimensions_and_project :
  octagonal_shape_float -> int -> unit
val ppl_Octagonal_Shape_float_remove_space_dimensions :
  octagonal_shape_float -> int list -> unit
val ppl_Octagonal_Shape_float_remove_higher_space_dimensions :
  octagonal_shape_float -> int -> unit
val ppl_Octagonal_Shape_float_expand_space_dimension :
  octagonal_shape_float -> int -> int -> unit
val ppl_Octagonal_Shape_float_fold_space_dimensions :
  octagonal_shape_float -> int list -> int -> unit
val ppl_Octagonal_Shape_float_map_space_dimensions :
  octagonal_shape_float -> (int * int) list -> unit
val ppl_Octagonal_Shape_float_drop_some_non_integer_points :
  octagonal_shape_float -> complexity_class -> unit
val ppl_Octagonal_Shape_float_drop_some_non_integer_points_2 :
  octagonal_shape_float ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_float_ascii_dump : octagonal_shape_float -> string
val ppl_Octagonal_Shape_float_external_memory_in_bytes :
  octagonal_shape_float -> int
val ppl_Octagonal_Shape_float_total_memory_in_bytes :
  octagonal_shape_float -> int
val ppl_Octagonal_Shape_float_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_float ->
  octagonal_shape_float -> int -> int
val ppl_Octagonal_Shape_float_BHMZ05_widening_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_widening_assign_with_tokens :
  octagonal_shape_float ->
  octagonal_shape_float -> int -> int
val ppl_Octagonal_Shape_float_widening_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_float ->
  octagonal_shape_float -> constraint_system -> int -> int
val ppl_Octagonal_Shape_float_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_float ->
  octagonal_shape_float -> constraint_system -> int -> int
val ppl_Octagonal_Shape_float_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_float ->
  octagonal_shape_float -> constraint_system -> unit
val ppl_Octagonal_Shape_float_limited_CC76_extrapolation_assign :
  octagonal_shape_float ->
```

```
  octagonal_shape_float -> constraint_system -> unit
val ppl_Octagonal_Shape_float_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_float ->
  octagonal_shape_float -> int -> int
val ppl_Octagonal_Shape_float_CC76_extrapolation_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_CC76_narrowing_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_linear_partition :
  octagonal_shape_float ->
  octagonal_shape_float ->
  octagonal_shape_float * pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_float_wrap_assign :
  octagonal_shape_float ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_float :
  octagonal_shape_float -> bool
val ppl_termination_test_PR_Octagonal_Shape_float :
  octagonal_shape_float -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_float :
  octagonal_shape_float -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_float :
  octagonal_shape_float -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_float :
  octagonal_shape_float -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_float :
  octagonal_shape_float -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_float :
  octagonal_shape_float ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_float_2 :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_termination_test_PR_Octagonal_Shape_float_2 :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_float_2 :
  octagonal_shape_float ->
  octagonal_shape_float -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_float_2 :
  octagonal_shape_float ->
  octagonal_shape_float -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_float_2 :
  octagonal_shape_float ->
  octagonal_shape_float -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_float_2 :
  octagonal_shape_float ->
  octagonal_shape_float -> polyhedron
```

```
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_float_2 :
  octagonal_shape_float ->
  octagonal_shape_float ->
  polyhedron * polyhedron
val ppl_new_Pointset_Powerset_Float_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_float_box
val ppl_new_Pointset_Powerset_Float_Box_from_Pointset_Powerset_Float_Box :
  pointset_powerset_float_box ->
  pointset_powerset_float_box
val ppl_new_Pointset_Powerset_Float_Box_from_Float_Box :
  float_box -> pointset_powerset_float_box
val ppl_new_Pointset_Powerset_Float_Box_from_Pointset_Powerset_Float_Box_with_complex
  pointset_powerset_float_box ->
  complexity_class -> pointset_powerset_float_box
val ppl_new_Pointset_Powerset_Float_Box_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> pointset_powerset_float_box
val ppl_new_Pointset_Powerset_Float_Box_from_constraints :
  constraint_system -> pointset_powerset_float_box
val ppl_new_Pointset_Powerset_Float_Box_from_congruences :
  congruence_system -> pointset_powerset_float_box
val ppl_Pointset_Powerset_Float_Box_swap :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_space_dimension :
  pointset_powerset_float_box -> int
val ppl_Pointset_Powerset_Float_Box_affine_dimension :
  pointset_powerset_float_box -> int
val ppl_Pointset_Powerset_Float_Box_relation_with_constraint :
  pointset_powerset_float_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Float_Box_relation_with_generator :
  pointset_powerset_float_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Float_Box_relation_with_congruence :
  pointset_powerset_float_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Float_Box_is_empty :
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_is_universe :
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_is_bounded :
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_contains_integer_point :
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_is_topologically_closed :
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_is_discrete :
  pointset_powerset_float_box -> bool
```

```
val ppl_Pointset_Powerset_Float_Box_topological_closure_assign :
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_pairwise_reduce :
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_omega_reduce :
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_bounds_from_above :
  pointset_powerset_float_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Float_Box_bounds_from_below :
  pointset_powerset_float_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Float_Box_maximize :
  pointset_powerset_float_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Float_Box_minimize :
  pointset_powerset_float_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Float_Box_maximize_with_point :
  pointset_powerset_float_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Float_Box_minimize_with_point :
  pointset_powerset_float_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Float_Box_contains_Pointset_Powerset_Float_Box :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_strictly_contains_Pointset_Powerset_Float_Box :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_is_disjoint_from_Pointset_Powerset_Float_Box :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_geometrically_covers_Pointset_Powerset_Float_Box
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_geometrically_equals_Pointset_Powerset_Float_Box
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_equals_Pointset_Powerset_Float_Box :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_OK : pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_add_constraint :
  pointset_powerset_float_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Float_Box_add_congruence :
  pointset_powerset_float_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Float_Box_add_constraints :
  pointset_powerset_float_box -> constraint_system -> unit
```

```
val ppl_Pointset_Powerset_Float_Box_add_congruences :
  pointset_powerset_float_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Float_Box_refine_with_constraint :
  pointset_powerset_float_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Float_Box_refine_with_congruence :
  pointset_powerset_float_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Float_Box_refine_with_constraints :
  pointset_powerset_float_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Float_Box_refine_with_congruences :
  pointset_powerset_float_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Float_Box_intersection_assign :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_upper_bound_assign :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_difference_assign :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_concatenate_assign :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_time_elapse_assign :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_upper_bound_assign_if_exact :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_simplify_using_context_assign :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_constrains :
  pointset_powerset_float_box -> int -> bool
val ppl_Pointset_Powerset_Float_Box_unconstrain_space_dimension :
  pointset_powerset_float_box -> int -> unit
val ppl_Pointset_Powerset_Float_Box_unconstrain_space_dimensions :
  pointset_powerset_float_box -> int list -> unit
val ppl_Pointset_Powerset_Float_Box_affine_image :
  pointset_powerset_float_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Float_Box_affine_preimage :
  pointset_powerset_float_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Float_Box_bounded_affine_image :
  pointset_powerset_float_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Float_Box_bounded_affine_preimage :
  pointset_powerset_float_box ->
  int ->
```

```
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Float_Box_generalized_affine_image :
  pointset_powerset_float_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Float_Box_generalized_affine_preimage :
  pointset_powerset_float_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Float_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_float_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Float_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_float_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Float_Box_add_space_dimensions_and_embed :
  pointset_powerset_float_box -> int -> unit
val ppl_Pointset_Powerset_Float_Box_add_space_dimensions_and_project :
  pointset_powerset_float_box -> int -> unit
val ppl_Pointset_Powerset_Float_Box_remove_space_dimensions :
  pointset_powerset_float_box -> int list -> unit
val ppl_Pointset_Powerset_Float_Box_remove_higher_space_dimensions :
  pointset_powerset_float_box -> int -> unit
val ppl_Pointset_Powerset_Float_Box_expand_space_dimension :
  pointset_powerset_float_box -> int -> int -> unit
val ppl_Pointset_Powerset_Float_Box_fold_space_dimensions :
  pointset_powerset_float_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Float_Box_map_space_dimensions :
  pointset_powerset_float_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Float_Box_drop_some_non_integer_points :
  pointset_powerset_float_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Float_Box_drop_some_non_integer_points_2 :
  pointset_powerset_float_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Float_Box_ascii_dump :
  pointset_powerset_float_box -> string
val ppl_Pointset_Powerset_Float_Box_external_memory_in_bytes :
  pointset_powerset_float_box -> int
val ppl_Pointset_Powerset_Float_Box_total_memory_in_bytes :
  pointset_powerset_float_box -> int
val ppl_Pointset_Powerset_Float_Box_size : pointset_powerset_float_box -> int
type pointset_powerset_float_box_iterator
val ppl_new_Pointset_Powerset_Float_Box_iterator_from_iterator :
  pointset_powerset_float_box_iterator ->
  pointset_powerset_float_box_iterator
val ppl_Pointset_Powerset_Float_Box_begin_iterator :
  pointset_powerset_float_box ->
```

```
  pointset_powerset_float_box_iterator
val ppl_Pointset_Powerset_Float_Box_end_iterator :
  pointset_powerset_float_box ->
  pointset_powerset_float_box_iterator
val ppl_Pointset_Powerset_Float_Box_iterator_equals_iterator :
  pointset_powerset_float_box_iterator ->
  pointset_powerset_float_box_iterator -> bool
val ppl_Pointset_Powerset_Float_Box_increment_iterator :
  pointset_powerset_float_box_iterator -> unit
val ppl_Pointset_Powerset_Float_Box_decrement_iterator :
  pointset_powerset_float_box_iterator -> unit
val ppl_Pointset_Powerset_Float_Box_get_disjunct :
  pointset_powerset_float_box_iterator -> float_box
val ppl_Pointset_Powerset_Float_Box_add_disjunct :
  pointset_powerset_float_box -> float_box -> unit
val ppl_Pointset_Powerset_Float_Box_drop_disjunct :
  pointset_powerset_float_box ->
  pointset_powerset_float_box_iterator -> unit
val ppl_Pointset_Powerset_Float_Box_drop_disjuncts :
  pointset_powerset_float_box ->
  pointset_powerset_float_box_iterator ->
  pointset_powerset_float_box_iterator -> unit
val ppl_new_Pointset_Powerset_BD_Shape_float_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_bd_shape_float
val ppl_new_Pointset_Powerset_BD_Shape_float_from_Pointset_Powerset_BD_Shape_float :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float
val ppl_new_Pointset_Powerset_BD_Shape_float_from_BD_Shape_float :
  bd_shape_float -> pointset_powerset_bd_shape_float
val ppl_new_Pointset_Powerset_BD_Shape_float_from_Pointset_Powerset_BD_Shape_float_wi
  pointset_powerset_bd_shape_float ->
  complexity_class -> pointset_powerset_bd_shape_float
val ppl_new_Pointset_Powerset_BD_Shape_float_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> pointset_powerset_bd_shape_float
val ppl_new_Pointset_Powerset_BD_Shape_float_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_float
val ppl_new_Pointset_Powerset_BD_Shape_float_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_float
val ppl_Pointset_Powerset_BD_Shape_float_swap :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_space_dimension :
  pointset_powerset_bd_shape_float -> int
val ppl_Pointset_Powerset_BD_Shape_float_affine_dimension :
  pointset_powerset_bd_shape_float -> int
val ppl_Pointset_Powerset_BD_Shape_float_relation_with_constraint :
  pointset_powerset_bd_shape_float ->
```

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  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_float_relation_with_generator :
  pointset_powerset_bd_shape_float ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_float_relation_with_congruence :
  pointset_powerset_bd_shape_float ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_float_is_empty :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_is_universe :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_is_bounded :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_contains_integer_point :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_is_topologically_closed :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_is_discrete :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_topological_closure_assign :
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_pairwise_reduce :
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_omega_reduce :
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_bounds_from_above :
  pointset_powerset_bd_shape_float ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_float_bounds_from_below :
  pointset_powerset_bd_shape_float ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_float_maximize :
  pointset_powerset_bd_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_float_minimize :
  pointset_powerset_bd_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_float_maximize_with_point :
  pointset_powerset_bd_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_float_minimize_with_point :
  pointset_powerset_bd_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_float_contains_Pointset_Powerset_BD_Shape_float :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_strictly_contains_Pointset_Powerset_BD_Shape
```

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  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_is_disjoint_from_Pointset_Powerset_BD_Shape_
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_geometrically_covers_Pointset_Powerset_BD_Sh
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_geometrically_equals_Pointset_Powerset_BD_Sh
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_equals_Pointset_Powerset_BD_Shape_float :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_OK :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_add_constraint :
  pointset_powerset_bd_shape_float ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_float_add_congruence :
  pointset_powerset_bd_shape_float ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_float_add_constraints :
  pointset_powerset_bd_shape_float ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_float_add_congruences :
  pointset_powerset_bd_shape_float ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_float_refine_with_constraint :
  pointset_powerset_bd_shape_float ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_float_refine_with_congruence :
  pointset_powerset_bd_shape_float ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_float_refine_with_constraints :
  pointset_powerset_bd_shape_float ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_float_refine_with_congruences :
  pointset_powerset_bd_shape_float ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_float_intersection_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_upper_bound_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_difference_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_concatenate_assign :
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  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_time_elapse_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_simplify_using_context_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_constrains :
  pointset_powerset_bd_shape_float -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_float_unconstrain_space_dimension :
  pointset_powerset_bd_shape_float -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_float -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_float_affine_image :
  pointset_powerset_bd_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_float_affine_preimage :
  pointset_powerset_bd_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_float_bounded_affine_image :
  pointset_powerset_bd_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_float_bounded_affine_preimage :
  pointset_powerset_bd_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_float_generalized_affine_image :
  pointset_powerset_bd_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_float_generalized_affine_preimage :
  pointset_powerset_bd_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_float_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_float_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_float_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_float -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_add_space_dimensions_and_project :
```

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  pointset_powerset_bd_shape_float -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_remove_space_dimensions :
  pointset_powerset_bd_shape_float -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_float_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_float -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_expand_space_dimension :
  pointset_powerset_bd_shape_float -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_fold_space_dimensions :
  pointset_powerset_bd_shape_float -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_map_space_dimensions :
  pointset_powerset_bd_shape_float -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_float_drop_some_non_integer_points :
  pointset_powerset_bd_shape_float ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_float_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_float ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_float_ascii_dump :
  pointset_powerset_bd_shape_float -> string
val ppl_Pointset_Powerset_BD_Shape_float_external_memory_in_bytes :
  pointset_powerset_bd_shape_float -> int
val ppl_Pointset_Powerset_BD_Shape_float_total_memory_in_bytes :
  pointset_powerset_bd_shape_float -> int
val ppl_Pointset_Powerset_BD_Shape_float_size :
  pointset_powerset_bd_shape_float -> int
type pointset_powerset_bd_shape_float_iterator
val ppl_new_Pointset_Powerset_BD_Shape_float_iterator_from_iterator :
  pointset_powerset_bd_shape_float_iterator ->
  pointset_powerset_bd_shape_float_iterator
val ppl_Pointset_Powerset_BD_Shape_float_begin_iterator :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float_iterator
val ppl_Pointset_Powerset_BD_Shape_float_end_iterator :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float_iterator
val ppl_Pointset_Powerset_BD_Shape_float_iterator_equals_iterator :
  pointset_powerset_bd_shape_float_iterator ->
  pointset_powerset_bd_shape_float_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_float_increment_iterator :
  pointset_powerset_bd_shape_float_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_float_decrement_iterator :
  pointset_powerset_bd_shape_float_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_float_get_disjunct :
  pointset_powerset_bd_shape_float_iterator ->
  bd_shape_float
val ppl_Pointset_Powerset_BD_Shape_float_add_disjunct :
  pointset_powerset_bd_shape_float ->
  bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_drop_disjunct :
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  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_float_drop_disjuncts :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float_iterator ->
  pointset_powerset_bd_shape_float_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_float_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_float
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_Pointset_Powerset_Octagonal_
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_Octagonal_Shape_float :
  octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_Pointset_Powerset_Octagonal_
  pointset_powerset_octagonal_shape_float ->
  complexity_class ->
  pointset_powerset_octagonal_shape_float
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_Octagonal_Shape_float_with_c
  octagonal_shape_float ->
  complexity_class ->
  pointset_powerset_octagonal_shape_float
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_float
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_float
val ppl_Pointset_Powerset_Octagonal_Shape_float_swap :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_space_dimension :
  pointset_powerset_octagonal_shape_float -> int
val ppl_Pointset_Powerset_Octagonal_Shape_float_affine_dimension :
  pointset_powerset_octagonal_shape_float -> int
val ppl_Pointset_Powerset_Octagonal_Shape_float_relation_with_constraint :
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  pointset_powerset_octagonal_shape_float ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_float_relation_with_generator :
  pointset_powerset_octagonal_shape_float ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_float_relation_with_congruence :
  pointset_powerset_octagonal_shape_float ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_float_is_empty :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_is_universe :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_is_bounded :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_contains_integer_point :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_is_topologically_closed :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_is_discrete :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_topological_closure_assign :
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_pairwise_reduce :
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_omega_reduce :
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_bounds_from_above :
  pointset_powerset_octagonal_shape_float ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_bounds_from_below :
  pointset_powerset_octagonal_shape_float ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_maximize :
  pointset_powerset_octagonal_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_minimize :
  pointset_powerset_octagonal_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_maximize_with_point :
  pointset_powerset_octagonal_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_float_minimize_with_point :
  pointset_powerset_octagonal_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_float_contains_Pointset_Powerset_Octagonal_
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
```

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val ppl_Pointset_Powerset_Octagonal_Shape_float_strictly_contains_Pointset_Powerset_O
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_is_disjoint_from_Pointset_Powerset_Oc
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_geometrically_covers_Pointset_Powerse
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_geometrically_equals_Pointset_Powerse
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_equals_Pointset_Powerset_Octagonal_Sh
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_OK :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_constraint :
  pointset_powerset_octagonal_shape_float ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_congruence :
  pointset_powerset_octagonal_shape_float ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_constraints :
  pointset_powerset_octagonal_shape_float ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_congruences :
  pointset_powerset_octagonal_shape_float ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_refine_with_constraint :
  pointset_powerset_octagonal_shape_float ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_refine_with_congruence :
  pointset_powerset_octagonal_shape_float ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_refine_with_constraints :
  pointset_powerset_octagonal_shape_float ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_refine_with_congruences :
  pointset_powerset_octagonal_shape_float ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_intersection_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_upper_bound_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_difference_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
```

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val ppl_Pointset_Powerset_Octagonal_Shape_float_concatenate_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_time_elapse_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_constrains :
  pointset_powerset_octagonal_shape_float -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_float -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_float -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_affine_image :
  pointset_powerset_octagonal_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_affine_preimage :
  pointset_powerset_octagonal_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_bounded_affine_image :
  pointset_powerset_octagonal_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_generalized_affine_image :
  pointset_powerset_octagonal_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_generalized_affine_image_lhs_rhs :
  pointset_powerset_octagonal_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_octagonal_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_float -> int -> unit
```

```
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_space_dimensions_and_project :
  pointset_powerset_octagonal_shape_float -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_remove_space_dimensions :
  pointset_powerset_octagonal_shape_float -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_float -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_expand_space_dimension :
  pointset_powerset_octagonal_shape_float -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_fold_space_dimensions :
  pointset_powerset_octagonal_shape_float -> int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_map_space_dimensions :
  pointset_powerset_octagonal_shape_float -> (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_float ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_float ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_ascii_dump :
  pointset_powerset_octagonal_shape_float -> string
val ppl_Pointset_Powerset_Octagonal_Shape_float_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_float -> int
val ppl_Pointset_Powerset_Octagonal_Shape_float_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_float -> int
val ppl_Pointset_Powerset_Octagonal_Shape_float_size :
  pointset_powerset_octagonal_shape_float -> int
type pointset_powerset_octagonal_shape_float_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_iterator_from_iterator :
  pointset_powerset_octagonal_shape_float_iterator ->
  pointset_powerset_octagonal_shape_float_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_float_begin_iterator :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_float_end_iterator :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_float_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_float_iterator ->
  pointset_powerset_octagonal_shape_float_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_increment_iterator :
  pointset_powerset_octagonal_shape_float_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_decrement_iterator :
  pointset_powerset_octagonal_shape_float_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_get_disjunct :
  pointset_powerset_octagonal_shape_float_iterator ->
  octagonal_shape_float
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_disjunct :
  pointset_powerset_octagonal_shape_float ->
  octagonal_shape_float -> unit
```

```
val ppl_Pointset_Powerset_Octagonal_Shape_float_drop_disjunct :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_drop_disjuncts :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float_iterator ->
  pointset_powerset_octagonal_shape_float_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> int -> unit
val ppl_new_Double_Box_from_space_dimension :
  int -> degenerate_element -> double_box
val ppl_new_Double_Box_from_Int8_Box : int8_box -> double_box
val ppl_new_Double_Box_from_Int16_Box : int16_box -> double_box
val ppl_new_Double_Box_from_Int32_Box : int32_box -> double_box
val ppl_new_Double_Box_from_Int64_Box : int64_box -> double_box
val ppl_new_Double_Box_from_Uint8_Box : uint8_box -> double_box
val ppl_new_Double_Box_from_Uint16_Box : uint16_box -> double_box
val ppl_new_Double_Box_from_Uint32_Box : uint32_box -> double_box
val ppl_new_Double_Box_from_Uint64_Box : uint64_box -> double_box
val ppl_new_Double_Box_from_Z_Box : z_box -> double_box
val ppl_new_Double_Box_from_Rational_Box : rational_box -> double_box
val ppl_new_Double_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> double_box
val ppl_new_Double_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> double_box
val ppl_new_Double_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> double_box
val ppl_new_Double_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> double_box
val ppl_new_Double_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> double_box
val ppl_new_Double_Box_from_C_Polyhedron : polyhedron -> double_box
val ppl_new_Double_Box_from_NNC_Polyhedron : polyhedron -> double_box
```

```
val ppl_new_Double_Box_from_Grid : grid -> double_box
val ppl_new_Double_Box_from_Float_Box : float_box -> double_box
val ppl_new_Double_Box_from_BD_Shape_float : bd_shape_float -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> double_box
val ppl_new_Double_Box_from_Double_Box : double_box -> double_box
val ppl_new_Double_Box_from_BD_Shape_double : bd_shape_double -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> double_box
val ppl_new_Double_Box_from_Long_Double_Box : long_double_box -> double_box
val ppl_new_Double_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> double_box
val ppl_new_Double_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
```

```
  complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> double_box
val ppl_new_Double_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> double_box
val ppl_new_Double_Box_from_Grid_with_complexity :
  grid -> complexity_class -> double_box
val ppl_new_Double_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> double_box
```

```
val ppl_new_Double_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_constraints : constraint_system -> double_box
val ppl_new_Double_Box_from_congruences : congruence_system -> double_box
val ppl_new_Double_Box_from_generators : generator_system -> double_box
val ppl_Double_Box_swap : double_box -> double_box -> unit
val ppl_Double_Box_space_dimension : double_box -> int
val ppl_Double_Box_affine_dimension : double_box -> int
val ppl_Double_Box_relation_with_constraint :
  double_box ->
  linear_constraint -> poly_con_relation list
val ppl_Double_Box_relation_with_generator :
  double_box ->
  linear_generator -> poly_gen_relation list
val ppl_Double_Box_relation_with_congruence :
  double_box ->
  linear_congruence -> poly_con_relation list
val ppl_Double_Box_get_constraints : double_box -> constraint_system
val ppl_Double_Box_get_congruences : double_box -> congruence_system
val ppl_Double_Box_get_minimized_constraints :
  double_box -> constraint_system
val ppl_Double_Box_get_minimized_congruences :
  double_box -> congruence_system
val ppl_Double_Box_is_empty : double_box -> bool
val ppl_Double_Box_is_universe : double_box -> bool
val ppl_Double_Box_is_bounded : double_box -> bool
val ppl_Double_Box_contains_integer_point : double_box -> bool
val ppl_Double_Box_is_topologically_closed : double_box -> bool
val ppl_Double_Box_is_discrete : double_box -> bool
val ppl_Double_Box_topological_closure_assign : double_box -> unit
val ppl_Double_Box_bounds_from_above :
  double_box -> linear_expression -> bool
val ppl_Double_Box_bounds_from_below :
  double_box -> linear_expression -> bool
val ppl_Double_Box_maximize :
  double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Double_Box_minimize :
  double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Double_Box_maximize_with_point :
  double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Double_Box_minimize_with_point :
  double_box ->
  linear_expression ->
```

```
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Double_Box_frequency :
  double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Double_Box_contains_Double_Box : double_box -> double_box -> bool
val ppl_Double_Box_strictly_contains_Double_Box :
  double_box -> double_box -> bool
val ppl_Double_Box_is_disjoint_from_Double_Box :
  double_box -> double_box -> bool
val ppl_Double_Box_equals_Double_Box : double_box -> double_box -> bool
val ppl_Double_Box_OK : double_box -> bool
val ppl_Double_Box_add_constraint : double_box -> linear_constraint -> unit
val ppl_Double_Box_add_congruence : double_box -> linear_congruence -> unit
val ppl_Double_Box_add_constraints : double_box -> constraint_system -> unit
val ppl_Double_Box_add_congruences : double_box -> congruence_system -> unit
val ppl_Double_Box_refine_with_constraint :
  double_box -> linear_constraint -> unit
val ppl_Double_Box_refine_with_congruence :
  double_box -> linear_congruence -> unit
val ppl_Double_Box_refine_with_constraints :
  double_box -> constraint_system -> unit
val ppl_Double_Box_refine_with_congruences :
  double_box -> congruence_system -> unit
val ppl_Double_Box_intersection_assign : double_box -> double_box -> unit
val ppl_Double_Box_upper_bound_assign : double_box -> double_box -> unit
val ppl_Double_Box_difference_assign : double_box -> double_box -> unit
val ppl_Double_Box_concatenate_assign : double_box -> double_box -> unit
val ppl_Double_Box_time_elapse_assign : double_box -> double_box -> unit
val ppl_Double_Box_upper_bound_assign_if_exact :
  double_box -> double_box -> bool
val ppl_Double_Box_simplify_using_context_assign :
  double_box -> double_box -> bool
val ppl_Double_Box_constrains : double_box -> int -> bool
val ppl_Double_Box_unconstrain_space_dimension : double_box -> int -> unit
val ppl_Double_Box_unconstrain_space_dimensions :
  double_box -> int list -> unit
val ppl_Double_Box_affine_image :
  double_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Double_Box_affine_preimage :
  double_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Double_Box_bounded_affine_image :
  double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Double_Box_bounded_affine_preimage :
  double_box ->
  int ->
```

```
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Double_Box_generalized_affine_image :
  double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Double_Box_generalized_affine_preimage :
  double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Double_Box_generalized_affine_image_lhs_rhs :
  double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Double_Box_generalized_affine_preimage_lhs_rhs :
  double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Double_Box_add_space_dimensions_and_embed : double_box -> int -> unit
val ppl_Double_Box_add_space_dimensions_and_project :
  double_box -> int -> unit
val ppl_Double_Box_remove_space_dimensions : double_box -> int list -> unit
val ppl_Double_Box_remove_higher_space_dimensions : double_box -> int -> unit
val ppl_Double_Box_expand_space_dimension : double_box -> int -> int -> unit
val ppl_Double_Box_fold_space_dimensions :
  double_box -> int list -> int -> unit
val ppl_Double_Box_map_space_dimensions :
  double_box -> (int * int) list -> unit
val ppl_Double_Box_drop_some_non_integer_points :
  double_box -> complexity_class -> unit
val ppl_Double_Box_drop_some_non_integer_points_2 :
  double_box -> int list -> complexity_class -> unit
val ppl_Double_Box_ascii_dump : double_box -> string
val ppl_Double_Box_external_memory_in_bytes : double_box -> int
val ppl_Double_Box_total_memory_in_bytes : double_box -> int
val ppl_Double_Box_CC76_widening_assign_with_tokens :
  double_box -> double_box -> int -> int
val ppl_Double_Box_CC76_widening_assign : double_box -> double_box -> unit
val ppl_Double_Box_widening_assign_with_tokens :
  double_box -> double_box -> int -> int
val ppl_Double_Box_widening_assign : double_box -> double_box -> unit
val ppl_Double_Box_limited_CC76_extrapolation_assign_with_tokens :
  double_box ->
  double_box -> constraint_system -> int -> int
val ppl_Double_Box_limited_CC76_extrapolation_assign :
  double_box ->
  double_box -> constraint_system -> unit
val ppl_Double_Box_linear_partition :
  double_box ->
```

```
  double_box ->
  double_box * pointset_powerset_nnc_polyhedron
val ppl_Double_Box_wrap_assign :
  double_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Double_Box : double_box -> bool
val ppl_termination_test_PR_Double_Box : double_box -> bool
val ppl_one_affine_ranking_function_MS_Double_Box :
  double_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Double_Box :
  double_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Double_Box : double_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Double_Box : double_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Double_Box :
  double_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Double_Box_2 : double_box -> double_box -> bool
val ppl_termination_test_PR_Double_Box_2 : double_box -> double_box -> bool
val ppl_one_affine_ranking_function_MS_Double_Box_2 :
  double_box ->
  double_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Double_Box_2 :
  double_box ->
  double_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Double_Box_2 :
  double_box -> double_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Double_Box_2 :
  double_box -> double_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Double_Box_2 :
  double_box ->
  double_box -> polyhedron * polyhedron
val ppl_new_BD_Shape_double_from_space_dimension :
  int -> degenerate_element -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int8_Box : int8_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int16_Box : int16_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int32_Box : int32_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int64_Box : int64_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint8_Box : uint8_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint16_Box : uint16_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint32_Box : uint32_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint64_Box : uint64_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Z_Box : z_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Rational_Box :
  rational_box -> bd_shape_double
```

```
val ppl_new_BD_Shape_double_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_C_Polyhedron : polyhedron -> bd_shape_double
val ppl_new_BD_Shape_double_from_NNC_Polyhedron :
  polyhedron -> bd_shape_double
val ppl_new_BD_Shape_double_from_Grid : grid -> bd_shape_double
val ppl_new_BD_Shape_double_from_Float_Box : float_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_float :
  bd_shape_float -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_double
val ppl_new_BD_Shape_double_from_Double_Box : double_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_double :
  bd_shape_double -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_double
val ppl_new_BD_Shape_double_from_Long_Double_Box :
  long_double_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int16_Box_with_complexity :
  int16_box ->
```

```
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
```

```
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_constraints :
  constraint_system -> bd_shape_double
val ppl_new_BD_Shape_double_from_congruences :
  congruence_system -> bd_shape_double
val ppl_new_BD_Shape_double_from_generators :
```

```
  generator_system -> bd_shape_double
val ppl_BD_Shape_double_swap : bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_space_dimension : bd_shape_double -> int
val ppl_BD_Shape_double_affine_dimension : bd_shape_double -> int
val ppl_BD_Shape_double_relation_with_constraint :
  bd_shape_double ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_double_relation_with_generator :
  bd_shape_double ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_double_relation_with_congruence :
  bd_shape_double ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_double_get_constraints :
  bd_shape_double -> constraint_system
val ppl_BD_Shape_double_get_congruences :
  bd_shape_double -> congruence_system
val ppl_BD_Shape_double_get_minimized_constraints :
  bd_shape_double -> constraint_system
val ppl_BD_Shape_double_get_minimized_congruences :
  bd_shape_double -> congruence_system
val ppl_BD_Shape_double_is_empty : bd_shape_double -> bool
val ppl_BD_Shape_double_is_universe : bd_shape_double -> bool
val ppl_BD_Shape_double_is_bounded : bd_shape_double -> bool
val ppl_BD_Shape_double_contains_integer_point : bd_shape_double -> bool
val ppl_BD_Shape_double_is_topologically_closed : bd_shape_double -> bool
val ppl_BD_Shape_double_is_discrete : bd_shape_double -> bool
val ppl_BD_Shape_double_topological_closure_assign : bd_shape_double -> unit
val ppl_BD_Shape_double_bounds_from_above :
  bd_shape_double -> linear_expression -> bool
val ppl_BD_Shape_double_bounds_from_below :
  bd_shape_double -> linear_expression -> bool
val ppl_BD_Shape_double_maximize :
  bd_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_double_minimize :
  bd_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_double_maximize_with_point :
  bd_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_double_minimize_with_point :
  bd_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_double_frequency :
  bd_shape_double ->
```

```
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_double_contains_BD_Shape_double :
  bd_shape_double -> bd_shape_double -> bool
val ppl_BD_Shape_double_strictly_contains_BD_Shape_double :
  bd_shape_double -> bd_shape_double -> bool
val ppl_BD_Shape_double_is_disjoint_from_BD_Shape_double :
  bd_shape_double -> bd_shape_double -> bool
val ppl_BD_Shape_double_equals_BD_Shape_double :
  bd_shape_double -> bd_shape_double -> bool
val ppl_BD_Shape_double_OK : bd_shape_double -> bool
val ppl_BD_Shape_double_add_constraint :
  bd_shape_double -> linear_constraint -> unit
val ppl_BD_Shape_double_add_congruence :
  bd_shape_double -> linear_congruence -> unit
val ppl_BD_Shape_double_add_constraints :
  bd_shape_double -> constraint_system -> unit
val ppl_BD_Shape_double_add_congruences :
  bd_shape_double -> congruence_system -> unit
val ppl_BD_Shape_double_refine_with_constraint :
  bd_shape_double -> linear_constraint -> unit
val ppl_BD_Shape_double_refine_with_congruence :
  bd_shape_double -> linear_congruence -> unit
val ppl_BD_Shape_double_refine_with_constraints :
  bd_shape_double -> constraint_system -> unit
val ppl_BD_Shape_double_refine_with_congruences :
  bd_shape_double -> congruence_system -> unit
val ppl_BD_Shape_double_intersection_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_upper_bound_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_difference_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_concatenate_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_time_elapse_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_upper_bound_assign_if_exact :
  bd_shape_double -> bd_shape_double -> bool
val ppl_BD_Shape_double_simplify_using_context_assign :
  bd_shape_double -> bd_shape_double -> bool
val ppl_BD_Shape_double_constrains : bd_shape_double -> int -> bool
val ppl_BD_Shape_double_unconstrain_space_dimension :
  bd_shape_double -> int -> unit
val ppl_BD_Shape_double_unconstrain_space_dimensions :
  bd_shape_double -> int list -> unit
val ppl_BD_Shape_double_affine_image :
  bd_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_BD_Shape_double_affine_preimage :
  bd_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_double_bounded_affine_image :
  bd_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_double_bounded_affine_preimage :
  bd_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_double_generalized_affine_image :
  bd_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_double_generalized_affine_preimage :
  bd_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_double_generalized_affine_image_lhs_rhs :
  bd_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_double_generalized_affine_preimage_lhs_rhs :
  bd_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_double_add_space_dimensions_and_embed :
  bd_shape_double -> int -> unit
val ppl_BD_Shape_double_add_space_dimensions_and_project :
  bd_shape_double -> int -> unit
val ppl_BD_Shape_double_remove_space_dimensions :
  bd_shape_double -> int list -> unit
val ppl_BD_Shape_double_remove_higher_space_dimensions :
  bd_shape_double -> int -> unit
val ppl_BD_Shape_double_expand_space_dimension :
  bd_shape_double -> int -> int -> unit
val ppl_BD_Shape_double_fold_space_dimensions :
  bd_shape_double -> int list -> int -> unit
val ppl_BD_Shape_double_map_space_dimensions :
  bd_shape_double -> (int * int) list -> unit
val ppl_BD_Shape_double_drop_some_non_integer_points :
  bd_shape_double -> complexity_class -> unit
val ppl_BD_Shape_double_drop_some_non_integer_points_2 :
  bd_shape_double -> int list -> complexity_class -> unit
val ppl_BD_Shape_double_ascii_dump : bd_shape_double -> string
val ppl_BD_Shape_double_external_memory_in_bytes : bd_shape_double -> int
val ppl_BD_Shape_double_total_memory_in_bytes : bd_shape_double -> int
val ppl_BD_Shape_double_BHMZ05_widening_assign_with_tokens :
```

```
  bd_shape_double -> bd_shape_double -> int -> int
val ppl_BD_Shape_double_H79_widening_assign_with_tokens :
  bd_shape_double -> bd_shape_double -> int -> int
val ppl_BD_Shape_double_BHMZ05_widening_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_H79_widening_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_widening_assign_with_tokens :
  bd_shape_double -> bd_shape_double -> int -> int
val ppl_BD_Shape_double_widening_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_double ->
  bd_shape_double -> constraint_system -> int -> int
val ppl_BD_Shape_double_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_double ->
  bd_shape_double -> constraint_system -> int -> int
val ppl_BD_Shape_double_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_double ->
  bd_shape_double -> constraint_system -> int -> int
val ppl_BD_Shape_double_limited_BHMZ05_extrapolation_assign :
  bd_shape_double ->
  bd_shape_double -> constraint_system -> unit
val ppl_BD_Shape_double_limited_H79_extrapolation_assign :
  bd_shape_double ->
  bd_shape_double -> constraint_system -> unit
val ppl_BD_Shape_double_limited_CC76_extrapolation_assign :
  bd_shape_double ->
  bd_shape_double -> constraint_system -> unit
val ppl_BD_Shape_double_CC76_extrapolation_assign_with_tokens :
  bd_shape_double -> bd_shape_double -> int -> int
val ppl_BD_Shape_double_CC76_extrapolation_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_CC76_narrowing_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_linear_partition :
  bd_shape_double ->
  bd_shape_double ->
  bd_shape_double * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_double_wrap_assign :
  bd_shape_double ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_double : bd_shape_double -> bool
val ppl_termination_test_PR_BD_Shape_double : bd_shape_double -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_double :
```

```
  bd_shape_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_double :
  bd_shape_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_double :
  bd_shape_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_double :
  bd_shape_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_double :
  bd_shape_double -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_double_2 :
  bd_shape_double -> bd_shape_double -> bool
val ppl_termination_test_PR_BD_Shape_double_2 :
  bd_shape_double -> bd_shape_double -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_double_2 :
  bd_shape_double ->
  bd_shape_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_double_2 :
  bd_shape_double ->
  bd_shape_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_double_2 :
  bd_shape_double ->
  bd_shape_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_double_2 :
  bd_shape_double ->
  bd_shape_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_double_2 :
  bd_shape_double ->
  bd_shape_double -> polyhedron * polyhedron
val ppl_new_Octagonal_Shape_double_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int8_Box :
  int8_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int16_Box :
  int16_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int32_Box :
  int32_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int64_Box :
  int64_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint8_Box :
  uint8_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint16_Box :
  uint16_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint32_Box :
  uint32_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint64_Box :
  uint64_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Z_Box :
  z_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Rational_Box :
```

```
  rational_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_C_Polyhedron :
  polyhedron -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Grid : grid -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Float_Box :
  float_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Double_Box :
  double_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Long_Double_Box :
  long_double_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_double
```

```
val ppl_new_Octagonal_Shape_double_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
```

```
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_long_double_with_complexity :
```

```
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_constraints :
  constraint_system -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_congruences :
  congruence_system -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_generators :
  generator_system -> octagonal_shape_double
val ppl_Octagonal_Shape_double_swap :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_space_dimension :
  octagonal_shape_double -> int
val ppl_Octagonal_Shape_double_affine_dimension :
  octagonal_shape_double -> int
val ppl_Octagonal_Shape_double_relation_with_constraint :
  octagonal_shape_double ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_double_relation_with_generator :
  octagonal_shape_double ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_double_relation_with_congruence :
  octagonal_shape_double ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_double_get_constraints :
  octagonal_shape_double -> constraint_system
val ppl_Octagonal_Shape_double_get_congruences :
  octagonal_shape_double -> congruence_system
val ppl_Octagonal_Shape_double_get_minimized_constraints :
  octagonal_shape_double -> constraint_system
val ppl_Octagonal_Shape_double_get_minimized_congruences :
  octagonal_shape_double -> congruence_system
val ppl_Octagonal_Shape_double_is_empty : octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_is_universe : octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_is_bounded : octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_contains_integer_point :
  octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_is_topologically_closed :
  octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_is_discrete : octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_topological_closure_assign :
  octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_bounds_from_above :
  octagonal_shape_double -> linear_expression -> bool
val ppl_Octagonal_Shape_double_bounds_from_below :
  octagonal_shape_double -> linear_expression -> bool
val ppl_Octagonal_Shape_double_maximize :
  octagonal_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
```

```
val ppl_Octagonal_Shape_double_minimize :
  octagonal_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_double_maximize_with_point :
  octagonal_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_double_minimize_with_point :
  octagonal_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_double_frequency :
  octagonal_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_double_contains_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_strictly_contains_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_is_disjoint_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_equals_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_OK : octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_add_constraint :
  octagonal_shape_double -> linear_constraint -> unit
val ppl_Octagonal_Shape_double_add_congruence :
  octagonal_shape_double -> linear_congruence -> unit
val ppl_Octagonal_Shape_double_add_constraints :
  octagonal_shape_double -> constraint_system -> unit
val ppl_Octagonal_Shape_double_add_congruences :
  octagonal_shape_double -> congruence_system -> unit
val ppl_Octagonal_Shape_double_refine_with_constraint :
  octagonal_shape_double -> linear_constraint -> unit
val ppl_Octagonal_Shape_double_refine_with_congruence :
  octagonal_shape_double -> linear_congruence -> unit
val ppl_Octagonal_Shape_double_refine_with_constraints :
  octagonal_shape_double -> constraint_system -> unit
val ppl_Octagonal_Shape_double_refine_with_congruences :
  octagonal_shape_double -> congruence_system -> unit
val ppl_Octagonal_Shape_double_intersection_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_upper_bound_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_difference_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_concatenate_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_time_elapse_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
```

```
val ppl_Octagonal_Shape_double_upper_bound_assign_if_exact :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_simplify_using_context_assign :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_constrains :
  octagonal_shape_double -> int -> bool
val ppl_Octagonal_Shape_double_unconstrain_space_dimension :
  octagonal_shape_double -> int -> unit
val ppl_Octagonal_Shape_double_unconstrain_space_dimensions :
  octagonal_shape_double -> int list -> unit
val ppl_Octagonal_Shape_double_affine_image :
  octagonal_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_double_affine_preimage :
  octagonal_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_double_bounded_affine_image :
  octagonal_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_double_bounded_affine_preimage :
  octagonal_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_double_generalized_affine_image :
  octagonal_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_double_generalized_affine_preimage :
  octagonal_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_double_generalized_affine_image_lhs_rhs :
  octagonal_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_double_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_double_add_space_dimensions_and_embed :
  octagonal_shape_double -> int -> unit
val ppl_Octagonal_Shape_double_add_space_dimensions_and_project :
  octagonal_shape_double -> int -> unit
val ppl_Octagonal_Shape_double_remove_space_dimensions :
  octagonal_shape_double -> int list -> unit
val ppl_Octagonal_Shape_double_remove_higher_space_dimensions :
  octagonal_shape_double -> int -> unit
val ppl_Octagonal_Shape_double_expand_space_dimension :
  octagonal_shape_double -> int -> int -> unit
```

```
val ppl_Octagonal_Shape_double_fold_space_dimensions :
  octagonal_shape_double -> int list -> int -> unit
val ppl_Octagonal_Shape_double_map_space_dimensions :
  octagonal_shape_double -> (int * int) list -> unit
val ppl_Octagonal_Shape_double_drop_some_non_integer_points :
  octagonal_shape_double -> complexity_class -> unit
val ppl_Octagonal_Shape_double_drop_some_non_integer_points_2 :
  octagonal_shape_double ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_double_ascii_dump : octagonal_shape_double -> string
val ppl_Octagonal_Shape_double_external_memory_in_bytes :
  octagonal_shape_double -> int
val ppl_Octagonal_Shape_double_total_memory_in_bytes :
  octagonal_shape_double -> int
val ppl_Octagonal_Shape_double_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_double ->
  octagonal_shape_double -> int -> int
val ppl_Octagonal_Shape_double_BHMZ05_widening_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_widening_assign_with_tokens :
  octagonal_shape_double ->
  octagonal_shape_double -> int -> int
val ppl_Octagonal_Shape_double_widening_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_double ->
  octagonal_shape_double -> constraint_system -> int -> int
val ppl_Octagonal_Shape_double_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_double ->
  octagonal_shape_double -> constraint_system -> int -> int
val ppl_Octagonal_Shape_double_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_double ->
  octagonal_shape_double -> constraint_system -> unit
val ppl_Octagonal_Shape_double_limited_CC76_extrapolation_assign :
  octagonal_shape_double ->
  octagonal_shape_double -> constraint_system -> unit
val ppl_Octagonal_Shape_double_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_double ->
  octagonal_shape_double -> int -> int
val ppl_Octagonal_Shape_double_CC76_extrapolation_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_CC76_narrowing_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_linear_partition :
  octagonal_shape_double ->
  octagonal_shape_double ->
  octagonal_shape_double * pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_double_wrap_assign :
  octagonal_shape_double ->
```

```
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_double :
  octagonal_shape_double -> bool
val ppl_termination_test_PR_Octagonal_Shape_double :
  octagonal_shape_double -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_double :
  octagonal_shape_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_double :
  octagonal_shape_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_double :
  octagonal_shape_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_double :
  octagonal_shape_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_double :
  octagonal_shape_double ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_double_2 :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_termination_test_PR_Octagonal_Shape_double_2 :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_double_2 :
  octagonal_shape_double ->
  octagonal_shape_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_double_2 :
  octagonal_shape_double ->
  octagonal_shape_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_double_2 :
  octagonal_shape_double ->
  octagonal_shape_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_double_2 :
  octagonal_shape_double ->
  octagonal_shape_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_double_2 :
  octagonal_shape_double ->
  octagonal_shape_double ->
  polyhedron * polyhedron
val ppl_new_Pointset_Powerset_Double_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_double_box
val ppl_new_Pointset_Powerset_Double_Box_from_Pointset_Powerset_Double_Box :
  pointset_powerset_double_box ->
  pointset_powerset_double_box
val ppl_new_Pointset_Powerset_Double_Box_from_Double_Box :
  double_box -> pointset_powerset_double_box
val ppl_new_Pointset_Powerset_Double_Box_from_Pointset_Powerset_Double_Box_with_compl
  pointset_powerset_double_box ->
  complexity_class -> pointset_powerset_double_box
```

```
val ppl_new_Pointset_Powerset_Double_Box_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> pointset_powerset_double_box
val ppl_new_Pointset_Powerset_Double_Box_from_constraints :
  constraint_system -> pointset_powerset_double_box
val ppl_new_Pointset_Powerset_Double_Box_from_congruences :
  congruence_system -> pointset_powerset_double_box
val ppl_Pointset_Powerset_Double_Box_swap :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_space_dimension :
  pointset_powerset_double_box -> int
val ppl_Pointset_Powerset_Double_Box_affine_dimension :
  pointset_powerset_double_box -> int
val ppl_Pointset_Powerset_Double_Box_relation_with_constraint :
  pointset_powerset_double_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Double_Box_relation_with_generator :
  pointset_powerset_double_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Double_Box_relation_with_congruence :
  pointset_powerset_double_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Double_Box_is_empty :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_is_universe :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_is_bounded :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_contains_integer_point :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_is_topologically_closed :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_is_discrete :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_topological_closure_assign :
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_pairwise_reduce :
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_omega_reduce :
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_bounds_from_above :
  pointset_powerset_double_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Double_Box_bounds_from_below :
  pointset_powerset_double_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Double_Box_maximize :
  pointset_powerset_double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Double_Box_minimize :
```

```
  pointset_powerset_double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Double_Box_maximize_with_point :
  pointset_powerset_double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Double_Box_minimize_with_point :
  pointset_powerset_double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Double_Box_contains_Pointset_Powerset_Double_Box :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_strictly_contains_Pointset_Powerset_Double_Box :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_is_disjoint_from_Pointset_Powerset_Double_Box :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_geometrically_covers_Pointset_Powerset_Double_Bo
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_geometrically_equals_Pointset_Powerset_Double_Bo
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_equals_Pointset_Powerset_Double_Box :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_OK :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_add_constraint :
  pointset_powerset_double_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Double_Box_add_congruence :
  pointset_powerset_double_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Double_Box_add_constraints :
  pointset_powerset_double_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Double_Box_add_congruences :
  pointset_powerset_double_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Double_Box_refine_with_constraint :
  pointset_powerset_double_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Double_Box_refine_with_congruence :
  pointset_powerset_double_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Double_Box_refine_with_constraints :
  pointset_powerset_double_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Double_Box_refine_with_congruences :
  pointset_powerset_double_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Double_Box_intersection_assign :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> unit
```

```
val ppl_Pointset_Powerset_Double_Box_upper_bound_assign :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_difference_assign :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_concatenate_assign :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_time_elapse_assign :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_upper_bound_assign_if_exact :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_simplify_using_context_assign :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_constrains :
  pointset_powerset_double_box -> int -> bool
val ppl_Pointset_Powerset_Double_Box_unconstrain_space_dimension :
  pointset_powerset_double_box -> int -> unit
val ppl_Pointset_Powerset_Double_Box_unconstrain_space_dimensions :
  pointset_powerset_double_box -> int list -> unit
val ppl_Pointset_Powerset_Double_Box_affine_image :
  pointset_powerset_double_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Double_Box_affine_preimage :
  pointset_powerset_double_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Double_Box_bounded_affine_image :
  pointset_powerset_double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Double_Box_bounded_affine_preimage :
  pointset_powerset_double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Double_Box_generalized_affine_image :
  pointset_powerset_double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Double_Box_generalized_affine_preimage :
  pointset_powerset_double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Double_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
```

```
val ppl_Pointset_Powerset_Double_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Double_Box_add_space_dimensions_and_embed :
  pointset_powerset_double_box -> int -> unit
val ppl_Pointset_Powerset_Double_Box_add_space_dimensions_and_project :
  pointset_powerset_double_box -> int -> unit
val ppl_Pointset_Powerset_Double_Box_remove_space_dimensions :
  pointset_powerset_double_box -> int list -> unit
val ppl_Pointset_Powerset_Double_Box_remove_higher_space_dimensions :
  pointset_powerset_double_box -> int -> unit
val ppl_Pointset_Powerset_Double_Box_expand_space_dimension :
  pointset_powerset_double_box -> int -> int -> unit
val ppl_Pointset_Powerset_Double_Box_fold_space_dimensions :
  pointset_powerset_double_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Double_Box_map_space_dimensions :
  pointset_powerset_double_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Double_Box_drop_some_non_integer_points :
  pointset_powerset_double_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Double_Box_drop_some_non_integer_points_2 :
  pointset_powerset_double_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Double_Box_ascii_dump :
  pointset_powerset_double_box -> string
val ppl_Pointset_Powerset_Double_Box_external_memory_in_bytes :
  pointset_powerset_double_box -> int
val ppl_Pointset_Powerset_Double_Box_total_memory_in_bytes :
  pointset_powerset_double_box -> int
val ppl_Pointset_Powerset_Double_Box_size :
  pointset_powerset_double_box -> int
type pointset_powerset_double_box_iterator
val ppl_new_Pointset_Powerset_Double_Box_iterator_from_iterator :
  pointset_powerset_double_box_iterator ->
  pointset_powerset_double_box_iterator
val ppl_Pointset_Powerset_Double_Box_begin_iterator :
  pointset_powerset_double_box ->
  pointset_powerset_double_box_iterator
val ppl_Pointset_Powerset_Double_Box_end_iterator :
  pointset_powerset_double_box ->
  pointset_powerset_double_box_iterator
val ppl_Pointset_Powerset_Double_Box_iterator_equals_iterator :
  pointset_powerset_double_box_iterator ->
  pointset_powerset_double_box_iterator -> bool
val ppl_Pointset_Powerset_Double_Box_increment_iterator :
  pointset_powerset_double_box_iterator -> unit
val ppl_Pointset_Powerset_Double_Box_decrement_iterator :
  pointset_powerset_double_box_iterator -> unit
val ppl_Pointset_Powerset_Double_Box_get_disjunct :
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  pointset_powerset_double_box_iterator -> double_box
val ppl_Pointset_Powerset_Double_Box_add_disjunct :
  pointset_powerset_double_box -> double_box -> unit
val ppl_Pointset_Powerset_Double_Box_drop_disjunct :
  pointset_powerset_double_box ->
  pointset_powerset_double_box_iterator -> unit
val ppl_Pointset_Powerset_Double_Box_drop_disjuncts :
  pointset_powerset_double_box ->
  pointset_powerset_double_box_iterator ->
  pointset_powerset_double_box_iterator -> unit
val ppl_new_Pointset_Powerset_BD_Shape_double_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_bd_shape_double
val ppl_new_Pointset_Powerset_BD_Shape_double_from_Pointset_Powerset_BD_Shape_double
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double
val ppl_new_Pointset_Powerset_BD_Shape_double_from_BD_Shape_double :
  bd_shape_double -> pointset_powerset_bd_shape_double
val ppl_new_Pointset_Powerset_BD_Shape_double_from_Pointset_Powerset_BD_Shape_double_
  pointset_powerset_bd_shape_double ->
  complexity_class -> pointset_powerset_bd_shape_double
val ppl_new_Pointset_Powerset_BD_Shape_double_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> pointset_powerset_bd_shape_double
val ppl_new_Pointset_Powerset_BD_Shape_double_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_double
val ppl_new_Pointset_Powerset_BD_Shape_double_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_double
val ppl_Pointset_Powerset_BD_Shape_double_swap :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_space_dimension :
  pointset_powerset_bd_shape_double -> int
val ppl_Pointset_Powerset_BD_Shape_double_affine_dimension :
  pointset_powerset_bd_shape_double -> int
val ppl_Pointset_Powerset_BD_Shape_double_relation_with_constraint :
  pointset_powerset_bd_shape_double ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_double_relation_with_generator :
  pointset_powerset_bd_shape_double ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_double_relation_with_congruence :
  pointset_powerset_bd_shape_double ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_double_is_empty :
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_is_universe :
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_is_bounded :
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  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_contains_integer_point :
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_is_topologically_closed :
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_is_discrete :
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_topological_closure_assign :
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_pairwise_reduce :
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_omega_reduce :
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_bounds_from_above :
  pointset_powerset_bd_shape_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_double_bounds_from_below :
  pointset_powerset_bd_shape_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_double_maximize :
  pointset_powerset_bd_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_double_minimize :
  pointset_powerset_bd_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_double_maximize_with_point :
  pointset_powerset_bd_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_double_minimize_with_point :
  pointset_powerset_bd_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_double_contains_Pointset_Powerset_BD_Shape_double
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_strictly_contains_Pointset_Powerset_BD_Shap
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_is_disjoint_from_Pointset_Powerset_BD_Shape
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_geometrically_covers_Pointset_Powerset_BD_S
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_geometrically_equals_Pointset_Powerset_BD_S
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_equals_Pointset_Powerset_BD_Shape_double :
  pointset_powerset_bd_shape_double ->
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  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_OK :
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_add_constraint :
  pointset_powerset_bd_shape_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_double_add_congruence :
  pointset_powerset_bd_shape_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_double_add_constraints :
  pointset_powerset_bd_shape_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_double_add_congruences :
  pointset_powerset_bd_shape_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_double_refine_with_constraint :
  pointset_powerset_bd_shape_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_double_refine_with_congruence :
  pointset_powerset_bd_shape_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_double_refine_with_constraints :
  pointset_powerset_bd_shape_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_double_refine_with_congruences :
  pointset_powerset_bd_shape_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_double_intersection_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_upper_bound_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_difference_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_concatenate_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_time_elapse_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_simplify_using_context_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_constrains :
  pointset_powerset_bd_shape_double -> int -> bool
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val ppl_Pointset_Powerset_BD_Shape_double_unconstrain_space_dimension :
  pointset_powerset_bd_shape_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_double -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_double_affine_image :
  pointset_powerset_bd_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_double_affine_preimage :
  pointset_powerset_bd_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_double_bounded_affine_image :
  pointset_powerset_bd_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_double_bounded_affine_preimage :
  pointset_powerset_bd_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_double_generalized_affine_image :
  pointset_powerset_bd_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_double_generalized_affine_preimage :
  pointset_powerset_bd_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_double_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_double_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_double_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_remove_space_dimensions :
  pointset_powerset_bd_shape_double -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_double_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_expand_space_dimension :
  pointset_powerset_bd_shape_double -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_fold_space_dimensions :
  pointset_powerset_bd_shape_double -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_map_space_dimensions :
  pointset_powerset_bd_shape_double -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_double_drop_some_non_integer_points :
  pointset_powerset_bd_shape_double ->
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  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_double_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_double ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_double_ascii_dump :
  pointset_powerset_bd_shape_double -> string
val ppl_Pointset_Powerset_BD_Shape_double_external_memory_in_bytes :
  pointset_powerset_bd_shape_double -> int
val ppl_Pointset_Powerset_BD_Shape_double_total_memory_in_bytes :
  pointset_powerset_bd_shape_double -> int
val ppl_Pointset_Powerset_BD_Shape_double_size :
  pointset_powerset_bd_shape_double -> int
type pointset_powerset_bd_shape_double_iterator
val ppl_new_Pointset_Powerset_BD_Shape_double_iterator_from_iterator :
  pointset_powerset_bd_shape_double_iterator ->
  pointset_powerset_bd_shape_double_iterator
val ppl_Pointset_Powerset_BD_Shape_double_begin_iterator :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double_iterator
val ppl_Pointset_Powerset_BD_Shape_double_end_iterator :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double_iterator
val ppl_Pointset_Powerset_BD_Shape_double_iterator_equals_iterator :
  pointset_powerset_bd_shape_double_iterator ->
  pointset_powerset_bd_shape_double_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_double_increment_iterator :
  pointset_powerset_bd_shape_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_double_decrement_iterator :
  pointset_powerset_bd_shape_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_double_get_disjunct :
  pointset_powerset_bd_shape_double_iterator ->
  bd_shape_double
val ppl_Pointset_Powerset_BD_Shape_double_add_disjunct :
  pointset_powerset_bd_shape_double ->
  bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_drop_disjunct :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_double_drop_disjuncts :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double_iterator ->
  pointset_powerset_bd_shape_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_double_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_BGP99_BHMZ05_extrapolation_assign :
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  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_Pointset_Powerset_Octagonal
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_Octagonal_Shape_double :
  octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_Pointset_Powerset_Octagonal
  pointset_powerset_octagonal_shape_double ->
  complexity_class ->
  pointset_powerset_octagonal_shape_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_Octagonal_Shape_double_with
  octagonal_shape_double ->
  complexity_class ->
  pointset_powerset_octagonal_shape_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_double
val ppl_Pointset_Powerset_Octagonal_Shape_double_swap :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_space_dimension :
  pointset_powerset_octagonal_shape_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_double_affine_dimension :
  pointset_powerset_octagonal_shape_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_double_relation_with_constraint :
  pointset_powerset_octagonal_shape_double ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_double_relation_with_generator :
  pointset_powerset_octagonal_shape_double ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_double_relation_with_congruence :
  pointset_powerset_octagonal_shape_double ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_double_is_empty :
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_is_universe :
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_is_bounded :
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  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_contains_integer_point :
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_is_topologically_closed :
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_is_discrete :
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_topological_closure_assign :
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_pairwise_reduce :
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_omega_reduce :
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_bounds_from_above :
  pointset_powerset_octagonal_shape_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_bounds_from_below :
  pointset_powerset_octagonal_shape_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_maximize :
  pointset_powerset_octagonal_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_minimize :
  pointset_powerset_octagonal_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_maximize_with_point :
  pointset_powerset_octagonal_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_double_minimize_with_point :
  pointset_powerset_octagonal_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_double_contains_Pointset_Powerset_Octagonal
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_strictly_contains_Pointset_Powerset_
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_is_disjoint_from_Pointset_Powerset_O
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_geometrically_covers_Pointset_Powers
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_geometrically_equals_Pointset_Powers
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_equals_Pointset_Powerset_Octagonal_S
  pointset_powerset_octagonal_shape_double ->
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  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_OK :
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_constraint :
  pointset_powerset_octagonal_shape_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_congruence :
  pointset_powerset_octagonal_shape_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_constraints :
  pointset_powerset_octagonal_shape_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_congruences :
  pointset_powerset_octagonal_shape_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_refine_with_constraint :
  pointset_powerset_octagonal_shape_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_refine_with_congruence :
  pointset_powerset_octagonal_shape_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_refine_with_constraints :
  pointset_powerset_octagonal_shape_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_refine_with_congruences :
  pointset_powerset_octagonal_shape_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_intersection_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_upper_bound_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_difference_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_concatenate_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_time_elapse_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_constrains :
  pointset_powerset_octagonal_shape_double -> int -> bool
```

```
val ppl_Pointset_Powerset_Octagonal_Shape_double_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_double -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_affine_image :
  pointset_powerset_octagonal_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_affine_preimage :
  pointset_powerset_octagonal_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_bounded_affine_image :
  pointset_powerset_octagonal_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_generalized_affine_image :
  pointset_powerset_octagonal_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_generalized_affine_image_lhs_rhs :
  pointset_powerset_octagonal_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_generalized_affine_preimage_lhs_rhs
  pointset_powerset_octagonal_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_space_dimensions_and_project :
  pointset_powerset_octagonal_shape_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_remove_space_dimensions :
  pointset_powerset_octagonal_shape_double -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_expand_space_dimension :
  pointset_powerset_octagonal_shape_double -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_fold_space_dimensions :
  pointset_powerset_octagonal_shape_double -> int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_map_space_dimensions :
  pointset_powerset_octagonal_shape_double ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_drop_some_non_integer_points :
```

```
  pointset_powerset_octagonal_shape_double ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_double ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_ascii_dump :
  pointset_powerset_octagonal_shape_double -> string
val ppl_Pointset_Powerset_Octagonal_Shape_double_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_double_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_double_size :
  pointset_powerset_octagonal_shape_double -> int
type pointset_powerset_octagonal_shape_double_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_iterator_from_iterator :
  pointset_powerset_octagonal_shape_double_iterator ->
  pointset_powerset_octagonal_shape_double_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_double_begin_iterator :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_double_end_iterator :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_double_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_double_iterator ->
  pointset_powerset_octagonal_shape_double_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_increment_iterator :
  pointset_powerset_octagonal_shape_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_decrement_iterator :
  pointset_powerset_octagonal_shape_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_get_disjunct :
  pointset_powerset_octagonal_shape_double_iterator ->
  octagonal_shape_double
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_disjunct :
  pointset_powerset_octagonal_shape_double ->
  octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_drop_disjunct :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_drop_disjuncts :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double_iterator ->
  pointset_powerset_octagonal_shape_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> int -> unit
```

```
val ppl_new_Long_Double_Box_from_space_dimension :
  int -> degenerate_element -> long_double_box
val ppl_new_Long_Double_Box_from_Int8_Box : int8_box -> long_double_box
val ppl_new_Long_Double_Box_from_Int16_Box : int16_box -> long_double_box
val ppl_new_Long_Double_Box_from_Int32_Box : int32_box -> long_double_box
val ppl_new_Long_Double_Box_from_Int64_Box : int64_box -> long_double_box
val ppl_new_Long_Double_Box_from_Uint8_Box : uint8_box -> long_double_box
val ppl_new_Long_Double_Box_from_Uint16_Box : uint16_box -> long_double_box
val ppl_new_Long_Double_Box_from_Uint32_Box : uint32_box -> long_double_box
val ppl_new_Long_Double_Box_from_Uint64_Box : uint64_box -> long_double_box
val ppl_new_Long_Double_Box_from_Z_Box : z_box -> long_double_box
val ppl_new_Long_Double_Box_from_Rational_Box :
  rational_box -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int8_t :
  bd_shape_int8_t -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int16_t :
  bd_shape_int16_t -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int32_t :
  bd_shape_int32_t -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int64_t :
  bd_shape_int64_t -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> long_double_box
val ppl_new_Long_Double_Box_from_C_Polyhedron : polyhedron -> long_double_box
val ppl_new_Long_Double_Box_from_NNC_Polyhedron :
  polyhedron -> long_double_box
val ppl_new_Long_Double_Box_from_Grid : grid -> long_double_box
val ppl_new_Long_Double_Box_from_Float_Box : float_box -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_float :
  bd_shape_float -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> long_double_box
val ppl_new_Long_Double_Box_from_Double_Box : double_box -> long_double_box
```

```
val ppl_new_Long_Double_Box_from_BD_Shape_double :
  bd_shape_double -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> long_double_box
val ppl_new_Long_Double_Box_from_Long_Double_Box :
  long_double_box -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> long_double_box
val ppl_new_Long_Double_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> long_double_box
```

```
val ppl_new_Long_Double_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Grid_with_complexity :
  grid -> complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> long_double_box
```

```
val ppl_new_Long_Double_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_constraints :
  constraint_system -> long_double_box
val ppl_new_Long_Double_Box_from_congruences :
  congruence_system -> long_double_box
val ppl_new_Long_Double_Box_from_generators :
  generator_system -> long_double_box
val ppl_Long_Double_Box_swap : long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_space_dimension : long_double_box -> int
val ppl_Long_Double_Box_affine_dimension : long_double_box -> int
val ppl_Long_Double_Box_relation_with_constraint :
  long_double_box ->
  linear_constraint -> poly_con_relation list
val ppl_Long_Double_Box_relation_with_generator :
  long_double_box ->
  linear_generator -> poly_gen_relation list
val ppl_Long_Double_Box_relation_with_congruence :
  long_double_box ->
  linear_congruence -> poly_con_relation list
val ppl_Long_Double_Box_get_constraints :
  long_double_box -> constraint_system
val ppl_Long_Double_Box_get_congruences :
  long_double_box -> congruence_system
val ppl_Long_Double_Box_get_minimized_constraints :
  long_double_box -> constraint_system
val ppl_Long_Double_Box_get_minimized_congruences :
  long_double_box -> congruence_system
val ppl_Long_Double_Box_is_empty : long_double_box -> bool
val ppl_Long_Double_Box_is_universe : long_double_box -> bool
val ppl_Long_Double_Box_is_bounded : long_double_box -> bool
val ppl_Long_Double_Box_contains_integer_point : long_double_box -> bool
val ppl_Long_Double_Box_is_topologically_closed : long_double_box -> bool
val ppl_Long_Double_Box_is_discrete : long_double_box -> bool
val ppl_Long_Double_Box_topological_closure_assign : long_double_box -> unit
val ppl_Long_Double_Box_bounds_from_above :
  long_double_box -> linear_expression -> bool
val ppl_Long_Double_Box_bounds_from_below :
  long_double_box -> linear_expression -> bool
val ppl_Long_Double_Box_maximize :
  long_double_box ->
```

```
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Long_Double_Box_minimize :
  long_double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Long_Double_Box_maximize_with_point :
  long_double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Long_Double_Box_minimize_with_point :
  long_double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Long_Double_Box_frequency :
  long_double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Long_Double_Box_contains_Long_Double_Box :
  long_double_box -> long_double_box -> bool
val ppl_Long_Double_Box_strictly_contains_Long_Double_Box :
  long_double_box -> long_double_box -> bool
val ppl_Long_Double_Box_is_disjoint_from_Long_Double_Box :
  long_double_box -> long_double_box -> bool
val ppl_Long_Double_Box_equals_Long_Double_Box :
  long_double_box -> long_double_box -> bool
val ppl_Long_Double_Box_OK : long_double_box -> bool
val ppl_Long_Double_Box_add_constraint :
  long_double_box -> linear_constraint -> unit
val ppl_Long_Double_Box_add_congruence :
  long_double_box -> linear_congruence -> unit
val ppl_Long_Double_Box_add_constraints :
  long_double_box -> constraint_system -> unit
val ppl_Long_Double_Box_add_congruences :
  long_double_box -> congruence_system -> unit
val ppl_Long_Double_Box_refine_with_constraint :
  long_double_box -> linear_constraint -> unit
val ppl_Long_Double_Box_refine_with_congruence :
  long_double_box -> linear_congruence -> unit
val ppl_Long_Double_Box_refine_with_constraints :
  long_double_box -> constraint_system -> unit
val ppl_Long_Double_Box_refine_with_congruences :
  long_double_box -> congruence_system -> unit
val ppl_Long_Double_Box_intersection_assign :
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_upper_bound_assign :
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_difference_assign :
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_concatenate_assign :
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_time_elapse_assign :
```

```
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_upper_bound_assign_if_exact :
  long_double_box -> long_double_box -> bool
val ppl_Long_Double_Box_simplify_using_context_assign :
  long_double_box -> long_double_box -> bool
val ppl_Long_Double_Box_constrains : long_double_box -> int -> bool
val ppl_Long_Double_Box_unconstrain_space_dimension :
  long_double_box -> int -> unit
val ppl_Long_Double_Box_unconstrain_space_dimensions :
  long_double_box -> int list -> unit
val ppl_Long_Double_Box_affine_image :
  long_double_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Long_Double_Box_affine_preimage :
  long_double_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Long_Double_Box_bounded_affine_image :
  long_double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Long_Double_Box_bounded_affine_preimage :
  long_double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Long_Double_Box_generalized_affine_image :
  long_double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Long_Double_Box_generalized_affine_preimage :
  long_double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Long_Double_Box_generalized_affine_image_lhs_rhs :
  long_double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Long_Double_Box_generalized_affine_preimage_lhs_rhs :
  long_double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Long_Double_Box_add_space_dimensions_and_embed :
  long_double_box -> int -> unit
val ppl_Long_Double_Box_add_space_dimensions_and_project :
  long_double_box -> int -> unit
val ppl_Long_Double_Box_remove_space_dimensions :
  long_double_box -> int list -> unit
val ppl_Long_Double_Box_remove_higher_space_dimensions :
  long_double_box -> int -> unit
val ppl_Long_Double_Box_expand_space_dimension :
  long_double_box -> int -> int -> unit
```

```
val ppl_Long_Double_Box_fold_space_dimensions :
  long_double_box -> int list -> int -> unit
val ppl_Long_Double_Box_map_space_dimensions :
  long_double_box -> (int * int) list -> unit
val ppl_Long_Double_Box_drop_some_non_integer_points :
  long_double_box -> complexity_class -> unit
val ppl_Long_Double_Box_drop_some_non_integer_points_2 :
  long_double_box -> int list -> complexity_class -> unit
val ppl_Long_Double_Box_ascii_dump : long_double_box -> string
val ppl_Long_Double_Box_external_memory_in_bytes : long_double_box -> int
val ppl_Long_Double_Box_total_memory_in_bytes : long_double_box -> int
val ppl_Long_Double_Box_CC76_widening_assign_with_tokens :
  long_double_box -> long_double_box -> int -> int
val ppl_Long_Double_Box_CC76_widening_assign :
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_widening_assign_with_tokens :
  long_double_box -> long_double_box -> int -> int
val ppl_Long_Double_Box_widening_assign :
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_limited_CC76_extrapolation_assign_with_tokens :
  long_double_box ->
  long_double_box -> constraint_system -> int -> int
val ppl_Long_Double_Box_limited_CC76_extrapolation_assign :
  long_double_box ->
  long_double_box -> constraint_system -> unit
val ppl_Long_Double_Box_linear_partition :
  long_double_box ->
  long_double_box ->
  long_double_box * pointset_powerset_nnc_polyhedron
val ppl_Long_Double_Box_wrap_assign :
  long_double_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Long_Double_Box : long_double_box -> bool
val ppl_termination_test_PR_Long_Double_Box : long_double_box -> bool
val ppl_one_affine_ranking_function_MS_Long_Double_Box :
  long_double_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Long_Double_Box :
  long_double_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Long_Double_Box :
  long_double_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Long_Double_Box :
  long_double_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Long_Double_Box :
  long_double_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Long_Double_Box_2 :
```

```
  long_double_box -> long_double_box -> bool
val ppl_termination_test_PR_Long_Double_Box_2 :
  long_double_box -> long_double_box -> bool
val ppl_one_affine_ranking_function_MS_Long_Double_Box_2 :
  long_double_box ->
  long_double_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Long_Double_Box_2 :
  long_double_box ->
  long_double_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Long_Double_Box_2 :
  long_double_box ->
  long_double_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Long_Double_Box_2 :
  long_double_box ->
  long_double_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Long_Double_Box_2 :
  long_double_box ->
  long_double_box -> polyhedron * polyhedron
val ppl_new_BD_Shape_long_double_from_space_dimension :
  int -> degenerate_element -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int8_Box :
  int8_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int16_Box :
  int16_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int32_Box :
  int32_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int64_Box :
  int64_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint8_Box :
  uint8_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint16_Box :
  uint16_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint32_Box :
  uint32_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint64_Box :
  uint64_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Z_Box : z_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Rational_Box :
  rational_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_long_double
```

```
val ppl_new_BD_Shape_long_double_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_C_Polyhedron :
  polyhedron -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_NNC_Polyhedron :
  polyhedron -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Grid : grid -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Float_Box :
  float_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_float :
  bd_shape_float -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Double_Box :
  double_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_double :
  bd_shape_double -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Long_Double_Box :
  long_double_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_long_double
```

```
val ppl_new_BD_Shape_long_double_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
```

```
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Grid_with_complexity :
  grid ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_constraints :
  constraint_system -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_congruences :
  congruence_system -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_generators :
  generator_system -> bd_shape_long_double
val ppl_BD_Shape_long_double_swap :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_space_dimension : bd_shape_long_double -> int
```

```
val ppl_BD_Shape_long_double_affine_dimension : bd_shape_long_double -> int
val ppl_BD_Shape_long_double_relation_with_constraint :
  bd_shape_long_double ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_long_double_relation_with_generator :
  bd_shape_long_double ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_long_double_relation_with_congruence :
  bd_shape_long_double ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_long_double_get_constraints :
  bd_shape_long_double -> constraint_system
val ppl_BD_Shape_long_double_get_congruences :
  bd_shape_long_double -> congruence_system
val ppl_BD_Shape_long_double_get_minimized_constraints :
  bd_shape_long_double -> constraint_system
val ppl_BD_Shape_long_double_get_minimized_congruences :
  bd_shape_long_double -> congruence_system
val ppl_BD_Shape_long_double_is_empty : bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_is_universe : bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_is_bounded : bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_contains_integer_point :
  bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_is_topologically_closed :
  bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_is_discrete : bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_topological_closure_assign :
  bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_bounds_from_above :
  bd_shape_long_double -> linear_expression -> bool
val ppl_BD_Shape_long_double_bounds_from_below :
  bd_shape_long_double -> linear_expression -> bool
val ppl_BD_Shape_long_double_maximize :
  bd_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_long_double_minimize :
  bd_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_long_double_maximize_with_point :
  bd_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_long_double_minimize_with_point :
  bd_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_long_double_frequency :
  bd_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
```

```
val ppl_BD_Shape_long_double_contains_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_strictly_contains_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_is_disjoint_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_equals_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_OK : bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_add_constraint :
  bd_shape_long_double -> linear_constraint -> unit
val ppl_BD_Shape_long_double_add_congruence :
  bd_shape_long_double -> linear_congruence -> unit
val ppl_BD_Shape_long_double_add_constraints :
  bd_shape_long_double -> constraint_system -> unit
val ppl_BD_Shape_long_double_add_congruences :
  bd_shape_long_double -> congruence_system -> unit
val ppl_BD_Shape_long_double_refine_with_constraint :
  bd_shape_long_double -> linear_constraint -> unit
val ppl_BD_Shape_long_double_refine_with_congruence :
  bd_shape_long_double -> linear_congruence -> unit
val ppl_BD_Shape_long_double_refine_with_constraints :
  bd_shape_long_double -> constraint_system -> unit
val ppl_BD_Shape_long_double_refine_with_congruences :
  bd_shape_long_double -> congruence_system -> unit
val ppl_BD_Shape_long_double_intersection_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_upper_bound_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_difference_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_concatenate_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_time_elapse_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_upper_bound_assign_if_exact :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_simplify_using_context_assign :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_constrains : bd_shape_long_double -> int -> bool
val ppl_BD_Shape_long_double_unconstrain_space_dimension :
  bd_shape_long_double -> int -> unit
val ppl_BD_Shape_long_double_unconstrain_space_dimensions :
  bd_shape_long_double -> int list -> unit
val ppl_BD_Shape_long_double_affine_image :
  bd_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_long_double_affine_preimage :
```

```
  bd_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_long_double_bounded_affine_image :
  bd_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_long_double_bounded_affine_preimage :
  bd_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_long_double_generalized_affine_image :
  bd_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_long_double_generalized_affine_preimage :
  bd_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_long_double_generalized_affine_image_lhs_rhs :
  bd_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_long_double_generalized_affine_preimage_lhs_rhs :
  bd_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_long_double_add_space_dimensions_and_embed :
  bd_shape_long_double -> int -> unit
val ppl_BD_Shape_long_double_add_space_dimensions_and_project :
  bd_shape_long_double -> int -> unit
val ppl_BD_Shape_long_double_remove_space_dimensions :
  bd_shape_long_double -> int list -> unit
val ppl_BD_Shape_long_double_remove_higher_space_dimensions :
  bd_shape_long_double -> int -> unit
val ppl_BD_Shape_long_double_expand_space_dimension :
  bd_shape_long_double -> int -> int -> unit
val ppl_BD_Shape_long_double_fold_space_dimensions :
  bd_shape_long_double -> int list -> int -> unit
val ppl_BD_Shape_long_double_map_space_dimensions :
  bd_shape_long_double -> (int * int) list -> unit
val ppl_BD_Shape_long_double_drop_some_non_integer_points :
  bd_shape_long_double -> complexity_class -> unit
val ppl_BD_Shape_long_double_drop_some_non_integer_points_2 :
  bd_shape_long_double ->
  int list -> complexity_class -> unit
val ppl_BD_Shape_long_double_ascii_dump : bd_shape_long_double -> string
val ppl_BD_Shape_long_double_external_memory_in_bytes :
  bd_shape_long_double -> int
val ppl_BD_Shape_long_double_total_memory_in_bytes :
  bd_shape_long_double -> int
```

```
val ppl_BD_Shape_long_double_BHMZ05_widening_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> int -> int
val ppl_BD_Shape_long_double_H79_widening_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> int -> int
val ppl_BD_Shape_long_double_BHMZ05_widening_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_H79_widening_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_widening_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> int -> int
val ppl_BD_Shape_long_double_widening_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> constraint_system -> int -> int
val ppl_BD_Shape_long_double_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> constraint_system -> int -> int
val ppl_BD_Shape_long_double_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> constraint_system -> int -> int
val ppl_BD_Shape_long_double_limited_BHMZ05_extrapolation_assign :
  bd_shape_long_double ->
  bd_shape_long_double -> constraint_system -> unit
val ppl_BD_Shape_long_double_limited_H79_extrapolation_assign :
  bd_shape_long_double ->
  bd_shape_long_double -> constraint_system -> unit
val ppl_BD_Shape_long_double_limited_CC76_extrapolation_assign :
  bd_shape_long_double ->
  bd_shape_long_double -> constraint_system -> unit
val ppl_BD_Shape_long_double_CC76_extrapolation_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> int -> int
val ppl_BD_Shape_long_double_CC76_extrapolation_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_CC76_narrowing_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_linear_partition :
  bd_shape_long_double ->
  bd_shape_long_double ->
  bd_shape_long_double * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_long_double_wrap_assign :
  bd_shape_long_double ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
```

```
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_long_double :
  bd_shape_long_double -> bool
val ppl_termination_test_PR_BD_Shape_long_double :
  bd_shape_long_double -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_long_double :
  bd_shape_long_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_long_double :
  bd_shape_long_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_long_double :
  bd_shape_long_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_long_double :
  bd_shape_long_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_long_double :
  bd_shape_long_double -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_long_double_2 :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_termination_test_PR_BD_Shape_long_double_2 :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_long_double_2 :
  bd_shape_long_double ->
  bd_shape_long_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_long_double_2 :
  bd_shape_long_double ->
  bd_shape_long_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_long_double_2 :
  bd_shape_long_double ->
  bd_shape_long_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_long_double_2 :
  bd_shape_long_double ->
  bd_shape_long_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_long_double_2 :
  bd_shape_long_double ->
  bd_shape_long_double -> polyhedron * polyhedron
val ppl_new_Octagonal_Shape_long_double_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int8_Box :
  int8_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int16_Box :
  int16_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int32_Box :
  int32_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int64_Box :
  int64_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint8_Box :
  uint8_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint16_Box :
  uint16_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint32_Box :
```

```
  uint32_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint64_Box :
  uint64_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Z_Box :
  z_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Rational_Box :
  rational_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_C_Polyhedron :
  polyhedron -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Grid :
  grid -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Float_Box :
  float_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Double_Box :
  double_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_double :
```

```
  octagonal_shape_double -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Long_Double_Box :
  long_double_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_long_double
```

```
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int16_t_with_complexity
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int32_t_with_complexity
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int64_t_with_complexity
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_mpz_class_with_complexit
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_mpq_class_with_complexit
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
```

```
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_long_double_with_complex
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_constraints :
  constraint_system -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_congruences :
  congruence_system -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_generators :
  generator_system -> octagonal_shape_long_double
val ppl_Octagonal_Shape_long_double_swap :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_space_dimension :
  octagonal_shape_long_double -> int
val ppl_Octagonal_Shape_long_double_affine_dimension :
  octagonal_shape_long_double -> int
val ppl_Octagonal_Shape_long_double_relation_with_constraint :
  octagonal_shape_long_double ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_long_double_relation_with_generator :
  octagonal_shape_long_double ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_long_double_relation_with_congruence :
  octagonal_shape_long_double ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_long_double_get_constraints :
  octagonal_shape_long_double -> constraint_system
val ppl_Octagonal_Shape_long_double_get_congruences :
  octagonal_shape_long_double -> congruence_system
val ppl_Octagonal_Shape_long_double_get_minimized_constraints :
  octagonal_shape_long_double -> constraint_system
val ppl_Octagonal_Shape_long_double_get_minimized_congruences :
  octagonal_shape_long_double -> congruence_system
val ppl_Octagonal_Shape_long_double_is_empty :
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_is_universe :
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_is_bounded :
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_contains_integer_point :
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_is_topologically_closed :
```

```
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_is_discrete :
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_topological_closure_assign :
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_bounds_from_above :
  octagonal_shape_long_double -> linear_expression -> bool
val ppl_Octagonal_Shape_long_double_bounds_from_below :
  octagonal_shape_long_double -> linear_expression -> bool
val ppl_Octagonal_Shape_long_double_maximize :
  octagonal_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_long_double_minimize :
  octagonal_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_long_double_maximize_with_point :
  octagonal_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_long_double_minimize_with_point :
  octagonal_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_long_double_frequency :
  octagonal_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_long_double_contains_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_strictly_contains_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_is_disjoint_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_equals_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_OK : octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_add_constraint :
  octagonal_shape_long_double -> linear_constraint -> unit
val ppl_Octagonal_Shape_long_double_add_congruence :
  octagonal_shape_long_double -> linear_congruence -> unit
val ppl_Octagonal_Shape_long_double_add_constraints :
  octagonal_shape_long_double -> constraint_system -> unit
val ppl_Octagonal_Shape_long_double_add_congruences :
  octagonal_shape_long_double -> congruence_system -> unit
val ppl_Octagonal_Shape_long_double_refine_with_constraint :
  octagonal_shape_long_double -> linear_constraint -> unit
```

```
val ppl_Octagonal_Shape_long_double_refine_with_congruence :
  octagonal_shape_long_double -> linear_congruence -> unit
val ppl_Octagonal_Shape_long_double_refine_with_constraints :
  octagonal_shape_long_double -> constraint_system -> unit
val ppl_Octagonal_Shape_long_double_refine_with_congruences :
  octagonal_shape_long_double -> congruence_system -> unit
val ppl_Octagonal_Shape_long_double_intersection_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_upper_bound_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_difference_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_concatenate_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_time_elapse_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_upper_bound_assign_if_exact :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_simplify_using_context_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_constrains :
  octagonal_shape_long_double -> int -> bool
val ppl_Octagonal_Shape_long_double_unconstrain_space_dimension :
  octagonal_shape_long_double -> int -> unit
val ppl_Octagonal_Shape_long_double_unconstrain_space_dimensions :
  octagonal_shape_long_double -> int list -> unit
val ppl_Octagonal_Shape_long_double_affine_image :
  octagonal_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_long_double_affine_preimage :
  octagonal_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_long_double_bounded_affine_image :
  octagonal_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_long_double_bounded_affine_preimage :
  octagonal_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_long_double_generalized_affine_image :
  octagonal_shape_long_double ->
  int ->
```

```
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_long_double_generalized_affine_preimage :
  octagonal_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_long_double_generalized_affine_image_lhs_rhs :
  octagonal_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_long_double_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_long_double_add_space_dimensions_and_embed :
  octagonal_shape_long_double -> int -> unit
val ppl_Octagonal_Shape_long_double_add_space_dimensions_and_project :
  octagonal_shape_long_double -> int -> unit
val ppl_Octagonal_Shape_long_double_remove_space_dimensions :
  octagonal_shape_long_double -> int list -> unit
val ppl_Octagonal_Shape_long_double_remove_higher_space_dimensions :
  octagonal_shape_long_double -> int -> unit
val ppl_Octagonal_Shape_long_double_expand_space_dimension :
  octagonal_shape_long_double -> int -> int -> unit
val ppl_Octagonal_Shape_long_double_fold_space_dimensions :
  octagonal_shape_long_double -> int list -> int -> unit
val ppl_Octagonal_Shape_long_double_map_space_dimensions :
  octagonal_shape_long_double -> (int * int) list -> unit
val ppl_Octagonal_Shape_long_double_drop_some_non_integer_points :
  octagonal_shape_long_double -> complexity_class -> unit
val ppl_Octagonal_Shape_long_double_drop_some_non_integer_points_2 :
  octagonal_shape_long_double ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_long_double_ascii_dump :
  octagonal_shape_long_double -> string
val ppl_Octagonal_Shape_long_double_external_memory_in_bytes :
  octagonal_shape_long_double -> int
val ppl_Octagonal_Shape_long_double_total_memory_in_bytes :
  octagonal_shape_long_double -> int
val ppl_Octagonal_Shape_long_double_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> int -> int
val ppl_Octagonal_Shape_long_double_BHMZ05_widening_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_widening_assign_with_tokens :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> int -> int
val ppl_Octagonal_Shape_long_double_widening_assign :
  octagonal_shape_long_double ->
```

```
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_long_double ->
  octagonal_shape_long_double ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_long_double_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_long_double ->
  octagonal_shape_long_double ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_long_double_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> constraint_system -> unit
val ppl_Octagonal_Shape_long_double_limited_CC76_extrapolation_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> constraint_system -> unit
val ppl_Octagonal_Shape_long_double_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> int -> int
val ppl_Octagonal_Shape_long_double_CC76_extrapolation_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_CC76_narrowing_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_linear_partition :
  octagonal_shape_long_double ->
  octagonal_shape_long_double ->
  octagonal_shape_long_double *
  pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_long_double_wrap_assign :
  octagonal_shape_long_double ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bool
val ppl_termination_test_PR_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
```

```
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_termination_test_PR_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double ->
  polyhedron * polyhedron
val ppl_new_Pointset_Powerset_Long_Double_Box_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_long_double_box
val ppl_new_Pointset_Powerset_Long_Double_Box_from_Pointset_Powerset_Long_Double_Box
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box
val ppl_new_Pointset_Powerset_Long_Double_Box_from_Long_Double_Box :
  long_double_box -> pointset_powerset_long_double_box
val ppl_new_Pointset_Powerset_Long_Double_Box_from_Pointset_Powerset_Long_Double_Box_
  pointset_powerset_long_double_box ->
  complexity_class -> pointset_powerset_long_double_box
val ppl_new_Pointset_Powerset_Long_Double_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> pointset_powerset_long_double_box
val ppl_new_Pointset_Powerset_Long_Double_Box_from_constraints :
  constraint_system -> pointset_powerset_long_double_box
val ppl_new_Pointset_Powerset_Long_Double_Box_from_congruences :
  congruence_system -> pointset_powerset_long_double_box
val ppl_Pointset_Powerset_Long_Double_Box_swap :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_space_dimension :
  pointset_powerset_long_double_box -> int
val ppl_Pointset_Powerset_Long_Double_Box_affine_dimension :
  pointset_powerset_long_double_box -> int
val ppl_Pointset_Powerset_Long_Double_Box_relation_with_constraint :
  pointset_powerset_long_double_box ->
```

```
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Long_Double_Box_relation_with_generator :
  pointset_powerset_long_double_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Long_Double_Box_relation_with_congruence :
  pointset_powerset_long_double_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Long_Double_Box_is_empty :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_is_universe :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_is_bounded :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_contains_integer_point :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_is_topologically_closed :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_is_discrete :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_topological_closure_assign :
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_pairwise_reduce :
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_omega_reduce :
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_bounds_from_above :
  pointset_powerset_long_double_box ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Long_Double_Box_bounds_from_below :
  pointset_powerset_long_double_box ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Long_Double_Box_maximize :
  pointset_powerset_long_double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Long_Double_Box_minimize :
  pointset_powerset_long_double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Long_Double_Box_maximize_with_point :
  pointset_powerset_long_double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Long_Double_Box_minimize_with_point :
  pointset_powerset_long_double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Long_Double_Box_contains_Pointset_Powerset_Long_Double_Box
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_strictly_contains_Pointset_Powerset_Long_Do
```

```
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_is_disjoint_from_Pointset_Powerset_Long_Dou
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_geometrically_covers_Pointset_Powerset_Long
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_geometrically_equals_Pointset_Powerset_Long
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_equals_Pointset_Powerset_Long_Double_Box :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_OK :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_add_constraint :
  pointset_powerset_long_double_box ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Long_Double_Box_add_congruence :
  pointset_powerset_long_double_box ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Long_Double_Box_add_constraints :
  pointset_powerset_long_double_box ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Long_Double_Box_add_congruences :
  pointset_powerset_long_double_box ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Long_Double_Box_refine_with_constraint :
  pointset_powerset_long_double_box ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Long_Double_Box_refine_with_congruence :
  pointset_powerset_long_double_box ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Long_Double_Box_refine_with_constraints :
  pointset_powerset_long_double_box ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Long_Double_Box_refine_with_congruences :
  pointset_powerset_long_double_box ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Long_Double_Box_intersection_assign :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_upper_bound_assign :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_difference_assign :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_concatenate_assign :
```

```
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_time_elapse_assign :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_upper_bound_assign_if_exact :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_simplify_using_context_assign :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_constrains :
  pointset_powerset_long_double_box -> int -> bool
val ppl_Pointset_Powerset_Long_Double_Box_unconstrain_space_dimension :
  pointset_powerset_long_double_box -> int -> unit
val ppl_Pointset_Powerset_Long_Double_Box_unconstrain_space_dimensions :
  pointset_powerset_long_double_box -> int list -> unit
val ppl_Pointset_Powerset_Long_Double_Box_affine_image :
  pointset_powerset_long_double_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Long_Double_Box_affine_preimage :
  pointset_powerset_long_double_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Long_Double_Box_bounded_affine_image :
  pointset_powerset_long_double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Long_Double_Box_bounded_affine_preimage :
  pointset_powerset_long_double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Long_Double_Box_generalized_affine_image :
  pointset_powerset_long_double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Long_Double_Box_generalized_affine_preimage :
  pointset_powerset_long_double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Long_Double_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_long_double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Long_Double_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_long_double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Long_Double_Box_add_space_dimensions_and_embed :
  pointset_powerset_long_double_box -> int -> unit
val ppl_Pointset_Powerset_Long_Double_Box_add_space_dimensions_and_project :
```

```
  pointset_powerset_long_double_box -> int -> unit
val ppl_Pointset_Powerset_Long_Double_Box_remove_space_dimensions :
  pointset_powerset_long_double_box -> int list -> unit
val ppl_Pointset_Powerset_Long_Double_Box_remove_higher_space_dimensions :
  pointset_powerset_long_double_box -> int -> unit
val ppl_Pointset_Powerset_Long_Double_Box_expand_space_dimension :
  pointset_powerset_long_double_box -> int -> int -> unit
val ppl_Pointset_Powerset_Long_Double_Box_fold_space_dimensions :
  pointset_powerset_long_double_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Long_Double_Box_map_space_dimensions :
  pointset_powerset_long_double_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Long_Double_Box_drop_some_non_integer_points :
  pointset_powerset_long_double_box ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Long_Double_Box_drop_some_non_integer_points_2 :
  pointset_powerset_long_double_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Long_Double_Box_ascii_dump :
  pointset_powerset_long_double_box -> string
val ppl_Pointset_Powerset_Long_Double_Box_external_memory_in_bytes :
  pointset_powerset_long_double_box -> int
val ppl_Pointset_Powerset_Long_Double_Box_total_memory_in_bytes :
  pointset_powerset_long_double_box -> int
val ppl_Pointset_Powerset_Long_Double_Box_size :
  pointset_powerset_long_double_box -> int
type pointset_powerset_long_double_box_iterator
val ppl_new_Pointset_Powerset_Long_Double_Box_iterator_from_iterator :
  pointset_powerset_long_double_box_iterator ->
  pointset_powerset_long_double_box_iterator
val ppl_Pointset_Powerset_Long_Double_Box_begin_iterator :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box_iterator
val ppl_Pointset_Powerset_Long_Double_Box_end_iterator :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box_iterator
val ppl_Pointset_Powerset_Long_Double_Box_iterator_equals_iterator :
  pointset_powerset_long_double_box_iterator ->
  pointset_powerset_long_double_box_iterator -> bool
val ppl_Pointset_Powerset_Long_Double_Box_increment_iterator :
  pointset_powerset_long_double_box_iterator -> unit
val ppl_Pointset_Powerset_Long_Double_Box_decrement_iterator :
  pointset_powerset_long_double_box_iterator -> unit
val ppl_Pointset_Powerset_Long_Double_Box_get_disjunct :
  pointset_powerset_long_double_box_iterator ->
  long_double_box
val ppl_Pointset_Powerset_Long_Double_Box_add_disjunct :
  pointset_powerset_long_double_box ->
  long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_drop_disjunct :
```

```
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box_iterator -> unit
val ppl_Pointset_Powerset_Long_Double_Box_drop_disjuncts :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box_iterator ->
  pointset_powerset_long_double_box_iterator -> unit
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_bd_shape_long_double
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_Pointset_Powerset_BD_Shape_lo
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_BD_Shape_long_double :
  bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_Pointset_Powerset_BD_Shape_lo
  pointset_powerset_bd_shape_long_double ->
  complexity_class ->
  pointset_powerset_bd_shape_long_double
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_BD_Shape_long_double_with_com
  bd_shape_long_double ->
  complexity_class ->
  pointset_powerset_bd_shape_long_double
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_constraints :
  constraint_system ->
  pointset_powerset_bd_shape_long_double
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_congruences :
  congruence_system ->
  pointset_powerset_bd_shape_long_double
val ppl_Pointset_Powerset_BD_Shape_long_double_swap :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_space_dimension :
  pointset_powerset_bd_shape_long_double -> int
val ppl_Pointset_Powerset_BD_Shape_long_double_affine_dimension :
  pointset_powerset_bd_shape_long_double -> int
val ppl_Pointset_Powerset_BD_Shape_long_double_relation_with_constraint :
  pointset_powerset_bd_shape_long_double ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_long_double_relation_with_generator :
  pointset_powerset_bd_shape_long_double ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_long_double_relation_with_congruence :
  pointset_powerset_bd_shape_long_double ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_long_double_is_empty :
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_is_universe :
  pointset_powerset_bd_shape_long_double -> bool
```

```
val ppl_Pointset_Powerset_BD_Shape_long_double_is_bounded :
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_contains_integer_point :
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_is_topologically_closed :
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_is_discrete :
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_topological_closure_assign :
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_pairwise_reduce :
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_omega_reduce :
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_bounds_from_above :
  pointset_powerset_bd_shape_long_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_bounds_from_below :
  pointset_powerset_bd_shape_long_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_maximize :
  pointset_powerset_bd_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_long_double_minimize :
  pointset_powerset_bd_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_long_double_maximize_with_point :
  pointset_powerset_bd_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_long_double_minimize_with_point :
  pointset_powerset_bd_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_long_double_contains_Pointset_Powerset_BD_Shape_lo
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_strictly_contains_Pointset_Powerset_BD
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_is_disjoint_from_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_geometrically_covers_Pointset_Powerset
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_geometrically_equals_Pointset_Powerset
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_equals_Pointset_Powerset_BD_Shape_long
```

```
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_OK :
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_add_constraint :
  pointset_powerset_bd_shape_long_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_add_congruence :
  pointset_powerset_bd_shape_long_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_add_constraints :
  pointset_powerset_bd_shape_long_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_add_congruences :
  pointset_powerset_bd_shape_long_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_refine_with_constraint :
  pointset_powerset_bd_shape_long_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_refine_with_congruence :
  pointset_powerset_bd_shape_long_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_refine_with_constraints :
  pointset_powerset_bd_shape_long_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_refine_with_congruences :
  pointset_powerset_bd_shape_long_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_intersection_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_upper_bound_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_difference_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_concatenate_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_time_elapse_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_simplify_using_context_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_constrains :
```

```
  pointset_powerset_bd_shape_long_double -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_unconstrain_space_dimension :
  pointset_powerset_bd_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_long_double -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_affine_image :
  pointset_powerset_bd_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_affine_preimage :
  pointset_powerset_bd_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_bounded_affine_image :
  pointset_powerset_bd_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_bounded_affine_preimage :
  pointset_powerset_bd_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_generalized_affine_image :
  pointset_powerset_bd_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_generalized_affine_preimage :
  pointset_powerset_bd_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_remove_space_dimensions :
  pointset_powerset_bd_shape_long_double -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_expand_space_dimension :
  pointset_powerset_bd_shape_long_double -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_fold_space_dimensions :
  pointset_powerset_bd_shape_long_double -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_map_space_dimensions :
  pointset_powerset_bd_shape_long_double -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_drop_some_non_integer_points :
```

```
  pointset_powerset_bd_shape_long_double ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_long_double ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_ascii_dump :
  pointset_powerset_bd_shape_long_double -> string
val ppl_Pointset_Powerset_BD_Shape_long_double_external_memory_in_bytes :
  pointset_powerset_bd_shape_long_double -> int
val ppl_Pointset_Powerset_BD_Shape_long_double_total_memory_in_bytes :
  pointset_powerset_bd_shape_long_double -> int
val ppl_Pointset_Powerset_BD_Shape_long_double_size :
  pointset_powerset_bd_shape_long_double -> int
type pointset_powerset_bd_shape_long_double_iterator
val ppl_new_Pointset_Powerset_BD_Shape_long_double_iterator_from_iterator :
  pointset_powerset_bd_shape_long_double_iterator ->
  pointset_powerset_bd_shape_long_double_iterator
val ppl_Pointset_Powerset_BD_Shape_long_double_begin_iterator :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double_iterator
val ppl_Pointset_Powerset_BD_Shape_long_double_end_iterator :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double_iterator
val ppl_Pointset_Powerset_BD_Shape_long_double_iterator_equals_iterator :
  pointset_powerset_bd_shape_long_double_iterator ->
  pointset_powerset_bd_shape_long_double_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_increment_iterator :
  pointset_powerset_bd_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_decrement_iterator :
  pointset_powerset_bd_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_get_disjunct :
  pointset_powerset_bd_shape_long_double_iterator ->
  bd_shape_long_double
val ppl_Pointset_Powerset_BD_Shape_long_double_add_disjunct :
  pointset_powerset_bd_shape_long_double ->
  bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_drop_disjunct :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_drop_disjuncts :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double_iterator ->
  pointset_powerset_bd_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
```

```
val ppl_Pointset_Powerset_BD_Shape_long_double_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_long_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_Pointset_Powerset_Octa
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_Octagonal_Shape_long_d
  octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_Pointset_Powerset_Octa
  pointset_powerset_octagonal_shape_long_double ->
  complexity_class ->
  pointset_powerset_octagonal_shape_long_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_Octagonal_Shape_long_d
  octagonal_shape_long_double ->
  complexity_class ->
  pointset_powerset_octagonal_shape_long_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_long_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_long_double
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_swap :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_space_dimension :
  pointset_powerset_octagonal_shape_long_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_affine_dimension :
  pointset_powerset_octagonal_shape_long_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_relation_with_constraint :
  pointset_powerset_octagonal_shape_long_double ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_relation_with_generator :
  pointset_powerset_octagonal_shape_long_double ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_relation_with_congruence :
  pointset_powerset_octagonal_shape_long_double ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_empty :
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_universe :
  pointset_powerset_octagonal_shape_long_double -> bool
```

```
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_bounded :
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_contains_integer_point :
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_topologically_closed :
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_discrete :
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_topological_closure_assign :
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_pairwise_reduce :
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_omega_reduce :
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_bounds_from_above :
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_bounds_from_below :
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_maximize :
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_minimize :
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_maximize_with_point :
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_minimize_with_point :
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_contains_Pointset_Powerset_Octa
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_strictly_contains_Pointset_Powe
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_disjoint_from_Pointset_Power
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_geometrically_covers_Pointset_P
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_geometrically_equals_Pointset_P
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_equals_Pointset_Powerset_Octago
```

```
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_OK :
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_constraint :
  pointset_powerset_octagonal_shape_long_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_congruence :
  pointset_powerset_octagonal_shape_long_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_constraints :
  pointset_powerset_octagonal_shape_long_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_congruences :
  pointset_powerset_octagonal_shape_long_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_refine_with_constraint :
  pointset_powerset_octagonal_shape_long_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_refine_with_congruence :
  pointset_powerset_octagonal_shape_long_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_refine_with_constraints :
  pointset_powerset_octagonal_shape_long_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_refine_with_congruences :
  pointset_powerset_octagonal_shape_long_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_intersection_assign :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_upper_bound_assign :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_difference_assign :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_concatenate_assign :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_time_elapse_assign :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_constrains :
```

```
  pointset_powerset_octagonal_shape_long_double -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_long_double -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_affine_image :
  pointset_powerset_octagonal_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_affine_preimage :
  pointset_powerset_octagonal_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_bounded_affine_image :
  pointset_powerset_octagonal_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_image :
  pointset_powerset_octagonal_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_image_lhs_rh
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_preimage_lhs
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_space_dimensions_and_embed
  pointset_powerset_octagonal_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_space_dimensions_and_projec
  pointset_powerset_octagonal_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_remove_space_dimensions :
  pointset_powerset_octagonal_shape_long_double -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_remove_higher_space_dimensions
  pointset_powerset_octagonal_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_expand_space_dimension :
  pointset_powerset_octagonal_shape_long_double -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_fold_space_dimensions :
  pointset_powerset_octagonal_shape_long_double ->
  int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_map_space_dimensions :
  pointset_powerset_octagonal_shape_long_double ->
```

```
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_long_double ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_drop_some_non_integer_points_2
  pointset_powerset_octagonal_shape_long_double ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_ascii_dump :
  pointset_powerset_octagonal_shape_long_double -> string
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_long_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_long_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_size :
  pointset_powerset_octagonal_shape_long_double -> int
type pointset_powerset_octagonal_shape_long_double_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_iterator_from_iterator :
  pointset_powerset_octagonal_shape_long_double_iterator ->
  pointset_powerset_octagonal_shape_long_double_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_begin_iterator :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_end_iterator :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_long_double_iterator ->
  pointset_powerset_octagonal_shape_long_double_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_increment_iterator :
  pointset_powerset_octagonal_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_decrement_iterator :
  pointset_powerset_octagonal_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_get_disjunct :
  pointset_powerset_octagonal_shape_long_double_iterator ->
  octagonal_shape_long_double
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_disjunct :
  pointset_powerset_octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_drop_disjunct :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_drop_disjuncts :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double_iterator ->
  pointset_powerset_octagonal_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_BHZ03_H79_BHMZ05_widening_assig
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_BGP99_BHMZ05_extrapolation_assi
```

```
pointset_powerset_octagonal_shape_long_double ->
pointset_powerset_octagonal_shape_long_double -> int -> unit
```

Compilation and Installation

When the Parma Polyhedra Library is configured, it tests for the existence of the OCaml system. If OCaml is correctly installed in a standard location, things are arranged so that the OCaml interface is built and installed.

3 GNU General Public License

Version 3, 29 June 2007

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5 Module Index

5.1 Modules

Here is a list of all modules:

OCaml Language Interface 481

6 Module Documentation

6.1 OCaml Language Interface

The Parma Polyhedra Library comes equipped with an interface for the OCaml language.

Index

artificial_parameter, 23

bd_shape_double, 25
bd_shape_float, 25
bd_shape_int16_t, 24
bd_shape_int32_t, 24
bd_shape_int64_t, 24
bd_shape_int8_t, 24
bd_shape_long_double, 25
bd_shape_mpq_class, 24
bd_shape_mpz_class, 24
bounded_integer_type_overflow, 20
bounded_integer_type_representation, 21
bounded_integer_type_width, 21

complexity_class, 21
congruence_system, 20
constraint_system, 20
constraints_product_c_polyhedron_grid, 25
constraints_product_grid_c_polyhedron, 25
constraints_product_grid_nnc_polyhedron, 25
constraints_product_nnc_polyhedron_grid, 25
control_parameter_name, 21
control_parameter_value, 21

degenerate_element, 20
double_box, 25

float_box, 25

generator_system, 20
grid, 24
grid_generator_system, 20

int16_box, 24
int32_box, 24
int64_box, 24
int8_box, 24

linear_congruence, 20
linear_constraint, 20
linear_expression, 20
linear_generator, 20
linear_grid_generator, 20
long_double_box, 25

mip_problem, 22
mip_problem_status, 21

OCaml Language Interface, 480
octagonal_shape_double, 25
octagonal_shape_float, 25
octagonal_shape_int16_t, 24
octagonal_shape_int32_t, 24
octagonal_shape_int64_t, 24
octagonal_shape_int8_t, 24
octagonal_shape_long_double, 25
octagonal_shape_mpq_class, 24
octagonal_shape_mpz_class, 24
optimization_mode, 21

pip_problem, 23
pip_problem_control_parameter_name, 21
pip_problem_control_parameter_value, 21
pip_problem_status, 21
pip_tree_node, 23
pointset_powerset_bd_shape_double, 25
pointset_powerset_bd_shape_double_iterator, 420
pointset_powerset_bd_shape_float, 25
pointset_powerset_bd_shape_float_iterator, 384
pointset_powerset_bd_shape_int16_t, 24
pointset_powerset_bd_shape_int16_t_iterator, 258
pointset_powerset_bd_shape_int32_t, 24
pointset_powerset_bd_shape_int32_t_iterator, 263
pointset_powerset_bd_shape_int64_t, 24
pointset_powerset_bd_shape_int64_t_iterator, 268
pointset_powerset_bd_shape_int8_t, 24
pointset_powerset_bd_shape_int8_t_iterator, 253
pointset_powerset_bd_shape_long_double, 25
pointset_powerset_bd_shape_long_double_iterator, 460
pointset_powerset_bd_shape_mpq_class, 24

pointset_powerset_bd_shape_mpq_class_iterator, 273
pointset_powerset_bd_shape_mpz_class, 25
pointset_powerset_bd_shape_mpz_class_iterator, 278
pointset_powerset_c_polyhedron, 25
pointset_powerset_c_polyhedron_iterator, 312
pointset_powerset_double_box, 25
pointset_powerset_double_box_iterator, 416
pointset_powerset_float_box, 25
pointset_powerset_float_box_iterator, 379
pointset_powerset_grid, 25
pointset_powerset_grid_iterator, 321
pointset_powerset_int16_box, 24
pointset_powerset_int16_box_iterator, 213
pointset_powerset_int32_box, 24
pointset_powerset_int32_box_iterator, 218
pointset_powerset_int64_box, 24
pointset_powerset_int64_box_iterator, 222
pointset_powerset_int8_box, 24
pointset_powerset_int8_box_iterator, 209
pointset_powerset_long_double_box, 25
pointset_powerset_long_double_box_iterator, 455
pointset_powerset_nnc_polyhedron, 25
pointset_powerset_nnc_polyhedron_iterator, 317
pointset_powerset_octagonal_shape_double, 25
pointset_powerset_octagonal_shape_double_iterator, 426
pointset_powerset_octagonal_shape_float, 25
pointset_powerset_octagonal_shape_float_iterator, 389
pointset_powerset_octagonal_shape_int16_t, 25
pointset_powerset_octagonal_shape_int16_t_iterator, 288
pointset_powerset_octagonal_shape_int32_t, 25
pointset_powerset_octagonal_shape_int32_t_iterator, 293
pointset_powerset_octagonal_shape_int64_t, 25
pointset_powerset_octagonal_shape_int64_t_iterator, 298
pointset_powerset_octagonal_shape_int8_t, 25
pointset_powerset_octagonal_shape_int8_t_iterator, 283
pointset_powerset_octagonal_shape_long_double, 25
pointset_powerset_octagonal_shape_long_double_iterator, 465
pointset_powerset_octagonal_shape_mpq_class, 25
pointset_powerset_octagonal_shape_mpq_class_iterator, 302
pointset_powerset_octagonal_shape_mpz_class, 25
pointset_powerset_octagonal_shape_mpz_class_iterator, 307
pointset_powerset_rational_box, 24
pointset_powerset_rational_box_iterator, 244
pointset_powerset_uint16_box, 24
pointset_powerset_uint16_box_iterator, 231
pointset_powerset_uint32_box, 24
pointset_powerset_uint32_box_iterator, 235
pointset_powerset_uint64_box, 24
pointset_powerset_uint64_box_iterator, 240
pointset_powerset_uint8_box, 24
pointset_powerset_uint8_box_iterator, 226
pointset_powerset_z_box, 24
pointset_powerset_z_box_iterator, 249
poly_con_relation, 20
poly_gen_relation, 20
polyhedron, 24
ppl_all_affine_quasi_ranking_functions_MS_BD_Shap 403
ppl_all_affine_quasi_ranking_functions_MS_BD_Shap 404
ppl_all_affine_quasi_ranking_functions_MS_BD_Shap 367
ppl_all_affine_quasi_ranking_functions_MS_BD_Shap 367
ppl_all_affine_quasi_ranking_functions_MS_BD_Shap 104
ppl_all_affine_quasi_ranking_functions_MS_BD_Shap 104
ppl_all_affine_quasi_ranking_functions_MS_BD_Shap 112

ppl_all_affine_quasi_ranking_functions_MS_Long_Double_2, 112
ppl_all_affine_quasi_ranking_functions_MS_Long_Double_3, 120
ppl_all_affine_quasi_ranking_functions_MS_NNC_Polyhedron_2, 120
ppl_all_affine_quasi_ranking_functions_MS_NNC_Polyhedron_3, 96
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int8_t_2, 96
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class, 442
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_2, 442
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpq_class, 136
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpq_class_2, 136
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_double, 128
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_double_2, 128
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_float, 198
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_float_2, 199
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int16_t, 396
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int16_t_2, 396
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int32_t, 359
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int32_t_2, 360
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int64_t, 205
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int64_t_2, 205
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int8_t, 37
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int8_t_2, 38
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_uint16_t, 44
ppl_all_affine_quasi_ranking_functions_MS_Rational_Box_int32_t_2, 44
ppl_all_affine_quasi_ranking_functions_MS_Rational_Box_int64_t, 50
ppl_all_affine_quasi_ranking_functions_MS_Uint16_Box_int64_t_2, 50
ppl_all_affine_quasi_ranking_functions_MS_Uint16_Box_int8_t, 31
ppl_all_affine_quasi_ranking_functions_MS_Uint32_Box_int8_t_2, 31
ppl_all_affine_quasi_ranking_functions_MS_Long_Double_Box_int32_t_2, 433
ppl_all_affine_quasi_ranking_functions_MS_Long_Double_Box_int64_t, 434
ppl_all_affine_quasi_ranking_functions_MS_NNC_Polyhedron_Box_int64_t_2, 198
ppl_all_affine_quasi_ranking_functions_MS_NNC_Polyhedron_Box_int8_t, 199
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int8_t_Box_int8_t_2, 412
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_long_double, 412
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_long_double_2, 375
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpq_class_2, 375
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_2, 153
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_3, 153
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_4, 162
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_5, 162
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_6, 170
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_7, 171
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_8, 144
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_9, 145
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_10, 450
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_11, 451
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_12, 188
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_13, 188
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_14, 179
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_15, 179
ppl_all_affine_quasi_ranking_functions_MS_Rational_Box_mpz_class_16, 88
ppl_all_affine_quasi_ranking_functions_MS_Rational_Box_mpz_class_17, 89
ppl_all_affine_quasi_ranking_functions_MS_Uint16_Box_mpz_class_18, 63
ppl_all_affine_quasi_ranking_functions_MS_Uint16_Box_mpz_class_19, 63
ppl_all_affine_quasi_ranking_functions_MS_Uint32_Box_mpz_class_20, 69

ppl_all_affine_quasi_ranking_functions_MS_Double_Box, 69
ppl_all_affine_quasi_ranking_functions_MS_Double_Box_2, 76
ppl_all_affine_quasi_ranking_functions_MS_Float_Box, 76
ppl_all_affine_quasi_ranking_functions_MS_Float_Box_2, 56
ppl_all_affine_quasi_ranking_functions_MS_Grid, 57
ppl_all_affine_quasi_ranking_functions_MS_Grid_2, 81
ppl_all_affine_quasi_ranking_functions_MS_Int16_Box, 82
ppl_all_affine_quasi_ranking_functions_MS_Int16_Box_2, 403
ppl_all_affine_quasi_ranking_functions_MS_Int32_Box, 404
ppl_all_affine_quasi_ranking_functions_MS_Int32_Box_2, 367
ppl_all_affine_quasi_ranking_functions_MS_Int64_Box, 367
ppl_all_affine_quasi_ranking_functions_MS_Int64_Box_2, 104
ppl_all_affine_quasi_ranking_functions_MS_Int8_Box, 104
ppl_all_affine_quasi_ranking_functions_MS_Int8_Box_2, 112
ppl_all_affine_quasi_ranking_functions_MS_Long_Double_Box, 112
ppl_all_affine_quasi_ranking_functions_MS_Long_Double_Box_2, 120
ppl_all_affine_quasi_ranking_functions_MS_NNC_Polyhedron, 120
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape, 96
ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_2, 96
ppl_all_affine_quasi_ranking_functions_MS_Rational_Box, 442
ppl_all_affine_quasi_ranking_functions_MS_Rational_Box_2, 442
ppl_all_affine_quasi_ranking_functions_MS_Ray, 136
ppl_all_affine_quasi_ranking_functions_MS_Ray_2, 136
ppl_all_affine_quasi_ranking_functions_MS_Saturation_Matrix, 128
ppl_all_affine_quasi_ranking_functions_MS_Saturation_Matrix_2, 128
ppl_all_affine_quasi_ranking_functions_MS_Polyhedron, 198
ppl_all_affine_quasi_ranking_functions_MS_Polyhedron_2, 199
ppl_all_affine_ranking_functions_MS_Double_Box, 396
ppl_all_affine_ranking_functions_MS_Double_Box_2, 396
ppl_all_affine_ranking_functions_MS_Float_Box, 359
ppl_all_affine_ranking_functions_MS_Float_Box_2, 359
ppl_all_affine_ranking_functions_MS_Grid, 205
ppl_all_affine_ranking_functions_MS_Grid_2, 205
ppl_all_affine_ranking_functions_MS_Int16_Box, 37
ppl_all_affine_ranking_functions_MS_Int16_Box_2, 37
ppl_all_affine_ranking_functions_MS_Int32_Box, 44
ppl_all_affine_ranking_functions_MS_Int32_Box_2, 44
ppl_all_affine_ranking_functions_MS_Int64_Box, 50
ppl_all_affine_ranking_functions_MS_Int64_Box_2, 50
ppl_all_affine_ranking_functions_MS_Int8_Box, 31
ppl_all_affine_ranking_functions_MS_Int8_Box_2, 31
ppl_all_affine_ranking_functions_MS_Long_Double_Box, 433
ppl_all_affine_ranking_functions_MS_Long_Double_Box_2, 434
ppl_all_affine_ranking_functions_MS_NNC_Polyhedron, 198
ppl_all_affine_ranking_functions_MS_Octagonal_Shape, 199
ppl_all_affine_ranking_functions_MS_Octagonal_Shape_2, 411
ppl_all_affine_ranking_functions_MS_Rational_Box, 412
ppl_all_affine_ranking_functions_MS_Rational_Box_2, 375
ppl_all_affine_ranking_functions_MS_Ray, 375
ppl_all_affine_ranking_functions_MS_Ray_2, 153
ppl_all_affine_ranking_functions_MS_Saturation_Matrix, 153
ppl_all_affine_ranking_functions_MS_Saturation_Matrix_2, 161
ppl_all_affine_ranking_functions_MS_Polyhedron, 162
ppl_all_affine_ranking_functions_MS_Polyhedron_2, 170

ppl_all_affine_ranking_functions_MS_Optimization_Info, 171
ppl_all_affine_ranking_functions_MS_Optimization_Info_int64_t_2, 112
ppl_all_affine_ranking_functions_MS_Optimization_Info_int8_t, 144
ppl_all_affine_ranking_functions_MS_Optimization_Info_int8_t_2, 112
ppl_all_affine_ranking_functions_MS_Optimization_Info_ranking_found, 145
ppl_all_affine_ranking_functions_MS_Optimization_Info_ranking_found_2, 120
ppl_all_affine_ranking_functions_MS_Optimization_Info_ranking_found_mpq_class, 450
ppl_all_affine_ranking_functions_MS_Optimization_Info_ranking_found_mpq_class_2, 120
ppl_all_affine_ranking_functions_MS_Optimization_Info_ranking_found_mpz_class, 451
ppl_all_affine_ranking_functions_MS_Optimization_Info_ranking_found_mpz_class_2, 96
ppl_all_affine_ranking_functions_MS_Optimization_Info_unknown, 188
ppl_all_affine_ranking_functions_MS_Optimization_Info_unknown_2, 96
ppl_all_affine_ranking_functions_MS_Optimization_Info_unsigned_int, 188
ppl_all_affine_ranking_functions_MS_Optimization_Info_unsigned_int_2, 442
ppl_all_affine_ranking_functions_MS_Optimization_Info_unsigned_long, 179
ppl_all_affine_ranking_functions_MS_Optimization_Info_unsigned_long_2, 442
ppl_all_affine_ranking_functions_MS_Optimization_Info_unsigned_long_long, 179
ppl_all_affine_ranking_functions_MS_Optimization_Info_unsigned_long_long_2, 136
ppl_all_affine_ranking_functions_MS_Partial_Function, 88
ppl_all_affine_ranking_functions_MS_Partial_Function_2, 136
ppl_all_affine_ranking_functions_MS_Polyhedron, 89
ppl_all_affine_ranking_functions_MS_Polyhedron_2, 128
ppl_all_affine_ranking_functions_MS_Uint16_Box, 63
ppl_all_affine_ranking_functions_MS_Uint16_Box_2, 128
ppl_all_affine_ranking_functions_MS_Uint32_Box, 63
ppl_all_affine_ranking_functions_MS_Uint32_Box_2, 198
ppl_all_affine_ranking_functions_MS_Uint64_Box, 69
ppl_all_affine_ranking_functions_MS_Uint64_Box_2, 199
ppl_all_affine_ranking_functions_MS_Uint8_Box, 69
ppl_all_affine_ranking_functions_MS_Uint8_Box_2, 396
ppl_all_affine_ranking_functions_MS_Variables_Set, 75
ppl_all_affine_ranking_functions_MS_Variables_Set_2, 396
ppl_all_affine_ranking_functions_MS_Z3_Box, 76
ppl_all_affine_ranking_functions_MS_Z3_Box_2, 359
ppl_all_affine_ranking_functions_PR_Double_Box, 56
ppl_all_affine_ranking_functions_PR_Double_Box_2, 360
ppl_all_affine_ranking_functions_PR_Float_Box, 56
ppl_all_affine_ranking_functions_PR_Float_Box_2, 205
ppl_all_affine_ranking_functions_PR_Grid, 81
ppl_all_affine_ranking_functions_PR_Grid_2, 205
ppl_all_affine_ranking_functions_PR_Int16_Box, 82
ppl_all_affine_ranking_functions_PR_Int16_Box_2, 37
ppl_all_affine_ranking_functions_PR_Int32_Box, 403
ppl_all_affine_ranking_functions_PR_Int32_Box_2, 38
ppl_all_affine_ranking_functions_PR_Int64_Box, 404
ppl_all_affine_ranking_functions_PR_Int64_Box_2, 44
ppl_all_affine_ranking_functions_PR_Int8_Box, 367
ppl_all_affine_ranking_functions_PR_Int8_Box_2, 44
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_double, 367
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_double_2, 50
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int16_t, 104
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int16_t_2, 50
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int8_t, 104
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int8_t_2, 31

ppl_all_affine_ranking_functions_PR_Int8_Box_2, 31
ppl_all_affine_ranking_functions_PR_Interval, 433
ppl_all_affine_ranking_functions_PR_NNC_Polyhedron, 198
ppl_all_affine_ranking_functions_PR_NNC_Polyhedron_2, 199
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_double, 412
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_double_2, 412
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_float, 375
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_float_2, 375
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_mpq_class, 153
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_mpq_class_2, 153
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_mpz_class, 161
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_mpz_class_2, 162
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_ptrdiff_t, 170
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_ptrdiff_t_2, 171
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_size_t, 144
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_size_t_2, 145
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_unsigned_int, 450
ppl_all_affine_ranking_functions_PR_Octagonal_Shape_unsigned_int_2, 451
ppl_all_affine_ranking_functions_PR_Rational_Box, 188
ppl_all_affine_ranking_functions_PR_Rational_Box_2, 188
ppl_all_affine_ranking_functions_PR_Uint16_Box, 179
ppl_all_affine_ranking_functions_PR_Uint16_Box_2, 179
ppl_all_affine_ranking_functions_PR_Uint32_Box, 88
ppl_all_affine_ranking_functions_PR_Uint32_Box_2, 89
ppl_all_affine_ranking_functions_PR_Uint64_Box, 63
ppl_all_affine_ranking_functions_PR_Uint64_Box_2, 63
ppl_all_affine_ranking_functions_PR_Uint8_Box, 31
ppl_all_affine_ranking_functions_PR_Uint8_Box_2, 433
ppl_all_affine_ranking_functions_PR_Z_Box, 434
ppl_all_affine_ranking_functions_PR_Z_Box_2, 198
PPL_arithmetic_error_code_t, 199
ppl_banner, 412
ppl_BD_Shape_double, 412
ppl_BD_Shape_double_2, 375
ppl_BD_Shape_float, 375
ppl_BD_Shape_float_2, 153
ppl_BD_Shape_mpq_class, 153
ppl_BD_Shape_mpq_class_2, 161
ppl_BD_Shape_mpz_class, 162
ppl_BD_Shape_mpz_class_2, 170
ppl_BD_Shape_ptrdiff_t, 171
ppl_BD_Shape_ptrdiff_t_2, 144
ppl_BD_Shape_size_t, 145
ppl_BD_Shape_size_t_2, 450
ppl_BD_Shape_unsigned_int, 451
ppl_BD_Shape_unsigned_int_2, 188
ppl_BD_Shape_double_BHMZ05_widening_assign, 188
ppl_BD_Shape_double_BHMZ05_widening_assign_with_t, 179
ppl_BD_Shape_double_bounded_affine_image, 179
ppl_BD_Shape_double_bounded_affine_preimage, 88
ppl_BD_Shape_double_bounds_from_above, 89
ppl_BD_Shape_double_bounds_from_below, 63
ppl_BD_Shape_double_CC76_extrapolation_assign, 63
ppl_BD_Shape_double_CC76_extrapolation_assign_wit, 31
ppl_BD_Shape_double_CC76_narrowing_assign, 433
ppl_BD_Shape_double_CC76_narrowing_assign_2, 434
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 198
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 199
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 412
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 412
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 375
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 375
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 153
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 153
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 161
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 162
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 170
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 171
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 144
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 145
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 450
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 451
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 188
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 188
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 179
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 179
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 88
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 89
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 63
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 63
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 31
ppl_BD_Shape_double_CC76_narrowing_assign_with_t, 433
ppl_BD_Shape_double_CC76_narrowing_assign_with_t

403
ppl_BD_Shape_double_concatenate_assign, 401
ppl_BD_Shape_double_constrains, 401
ppl_BD_Shape_double_contains_BD_Shape_double, 400
ppl_BD_Shape_double_contains_integer_point, 400
ppl_BD_Shape_double_difference_assign, 401
ppl_BD_Shape_double_drop_some_non_integer_points, 402
ppl_BD_Shape_double_drop_some_non_integer_points_2, 402
ppl_BD_Shape_double_equals_BD_Shape_double, 400
ppl_BD_Shape_double_expand_space_dimension, 402
ppl_BD_Shape_double_external_memory_in_bytes, 402
ppl_BD_Shape_double_fold_space_dimensions, 402
ppl_BD_Shape_double_frequency, 400
ppl_BD_Shape_double_generalized_affine_image, 402
ppl_BD_Shape_double_generalized_affine_image_lhs_rhs, 402
ppl_BD_Shape_double_generalized_affine_preimage, 402
ppl_BD_Shape_double_generalized_affine_preimage_lhs_rhs, 402
ppl_BD_Shape_double_get_congruences, 400
ppl_BD_Shape_double_get_constraints, 400
ppl_BD_Shape_double_get_minimized_congruences, 400
ppl_BD_Shape_double_get_minimized_constraints, 400
ppl_BD_Shape_double_H79_widening_assign, 402
ppl_BD_Shape_double_H79_widening_assign_with_tokens, 402
ppl_BD_Shape_double_intersection_assign, 401
ppl_BD_Shape_double_is_bounded, 400
ppl_BD_Shape_double_is_discrete, 400
ppl_BD_Shape_double_is_disjoint_from_BD_Shape_double, 400
ppl_BD_Shape_double_is_empty, 400
ppl_BD_Shape_double_is_topologically_closed, 400
ppl_BD_Shape_double_is_universe, 400
ppl_BD_Shape_double_limited_BHMZ05_extrapolation_
403
ppl_BD_Shape_double_limited_BHMZ05_extrapolation_
403
ppl_BD_Shape_double_limited_CC76_extrapolation_as
403
ppl_BD_Shape_double_limited_CC76_extrapolation_as
403
ppl_BD_Shape_double_limited_H79_extrapolation_ass
403
ppl_BD_Shape_double_limited_H79_extrapolation_ass
403
ppl_BD_Shape_double_linear_partition, 403
ppl_BD_Shape_double_map_space_dimensions, 402
ppl_BD_Shape_double_maximize, 400
ppl_BD_Shape_double_maximize_with_point, 400
ppl_BD_Shape_double_minimize, 400
ppl_BD_Shape_double_minimize_with_point, 400
ppl_BD_Shape_double_OK, 400
ppl_BD_Shape_double_refine_with_congruence, 401
ppl_BD_Shape_double_refine_with_congruences, 401
ppl_BD_Shape_double_refine_with_constraint, 401
ppl_BD_Shape_double_refine_with_constraints, 401
ppl_BD_Shape_double_relation_with_congruence, 400
ppl_BD_Shape_double_relation_with_constraint, 399
ppl_BD_Shape_double_relation_with_generator, 399
ppl_BD_Shape_double_remove_higher_space_dimensio
402
ppl_BD_Shape_double_remove_space_dimensions, 402
ppl_BD_Shape_double_simplify_using_context_assig
401
ppl_BD_Shape_double_space_dimension, 399
ppl_BD_Shape_double_strictly_contains_BD_Shape_d
400
ppl_BD_Shape_double_swap, 399
ppl_BD_Shape_double_time_elapse_assign, 401
ppl_BD_Shape_double_topological_closure_assign, 400
ppl_BD_Shape_double_total_memory_in_bytes, 402

ppl_BD_Shape_double_unconstrain_space_dimension, 401
ppl_BD_Shape_double_unconstrain_space_dimensions, 401
ppl_BD_Shape_double_upper_bound_assign, 401
ppl_BD_Shape_double_upper_bound_assign_if_exact, 401
ppl_BD_Shape_double_widening_assign, 402
ppl_BD_Shape_double_widening_assign_with_tokens, 402
ppl_BD_Shape_double_wrap_assign, 403
ppl_BD_Shape_float_add_congruence, 364
ppl_BD_Shape_float_add_congruences, 364
ppl_BD_Shape_float_add_constraint, 364
ppl_BD_Shape_float_add_constraints, 364
ppl_BD_Shape_float_add_space_dimensions_and_embed, 365
ppl_BD_Shape_float_add_space_dimensions_and_project, 365
ppl_BD_Shape_float_affine_dimension, 363
ppl_BD_Shape_float_affine_image, 365
ppl_BD_Shape_float_affine_preimage, 365
ppl_BD_Shape_float_ascii_dump, 366
ppl_BD_Shape_float_BHMZ05_widening_assign, 366
ppl_BD_Shape_float_BHMZ05_widening_assign_with_tokens, 366
ppl_BD_Shape_float_bounded_affine_image, 365
ppl_BD_Shape_float_bounded_affine_preimage, 365
ppl_BD_Shape_float_bounds_from_above, 363
ppl_BD_Shape_float_bounds_from_below, 363
ppl_BD_Shape_float_CC76_extrapolation_assign, 366
ppl_BD_Shape_float_CC76_extrapolation_assign_with_tokens, 366
ppl_BD_Shape_float_CC76_narrowing_assign, 366
ppl_BD_Shape_float_concatenate_assign, 364
ppl_BD_Shape_float_constrains, 365
ppl_BD_Shape_float_contains_BD_Shape_float, 364
ppl_BD_Shape_float_contains_integer_point, 363
ppl_BD_Shape_float_difference_assign, 364
ppl_BD_Shape_float_drop_some_non_integer_points, 366
ppl_BD_Shape_float_drop_some_non_integer_points_2 366
ppl_BD_Shape_float_equals_BD_Shape_float, 364
ppl_BD_Shape_float_expand_space_dimension, 365
ppl_BD_Shape_float_external_memory_in_bytes, 366
ppl_BD_Shape_float_fold_space_dimensions, 365
ppl_BD_Shape_float_frequency, 364
ppl_BD_Shape_float_generalized_affine_image, 365
ppl_BD_Shape_float_generalized_affine_image_lhs_ 365
ppl_BD_Shape_float_generalized_affine_preimage, 365
ppl_BD_Shape_float_generalized_affine_preimage_lh 365
ppl_BD_Shape_float_get_congruences, 363
ppl_BD_Shape_float_get_constraints, 363
ppl_BD_Shape_float_get_minimized_congruences, 363
ppl_BD_Shape_float_get_minimized_constraints, 363
ppl_BD_Shape_float_H79_widening_assign, 366
ppl_BD_Shape_float_H79_widening_assign_with_token 366
ppl_BD_Shape_float_intersection_assign, 364
ppl_BD_Shape_float_is_bounded, 363
ppl_BD_Shape_float_is_discrete, 363
ppl_BD_Shape_float_is_disjoint_from_BD_Shape_floa 364
ppl_BD_Shape_float_is_empty, 363
ppl_BD_Shape_float_is_topologically_closed, 363
ppl_BD_Shape_float_is_universe, 363
ppl_BD_Shape_float_limited_BHMZ05_extrapolation_a 366
ppl_BD_Shape_float_limited_BHMZ05_extrapolation_a 366
ppl_BD_Shape_float_limited_CC76_extrapolation_ass 366

ppl_BD_Shape_float_limited_CC76_extrapolation_assign_with_tokens, 366
ppl_BD_Shape_float_limited_H79_extrapolation_assign, 366
ppl_BD_Shape_float_limited_H79_extrapolation_assign_with_tokens, 366
ppl_BD_Shape_float_linear_partition, 366
ppl_BD_Shape_float_map_space_dimensions, 365
ppl_BD_Shape_float_maximize, 363
ppl_BD_Shape_float_maximize_with_point, 364
ppl_BD_Shape_float_minimize, 363
ppl_BD_Shape_float_minimize_with_point, 364
ppl_BD_Shape_float_OK, 364
ppl_BD_Shape_float_refine_with_congruence, 364
ppl_BD_Shape_float_refine_with_congruences, 364
ppl_BD_Shape_float_refine_with_constraint, 364
ppl_BD_Shape_float_refine_with_constraints, 364
ppl_BD_Shape_float_relation_with_congruence, 363
ppl_BD_Shape_float_relation_with_constraint, 363
ppl_BD_Shape_float_relation_with_generator, 363
ppl_BD_Shape_float_remove_higher_space_dimensions, 365
ppl_BD_Shape_float_remove_space_dimensions, 365
ppl_BD_Shape_float_simplify_using_context_assign, 365
ppl_BD_Shape_float_space_dimension, 363
ppl_BD_Shape_float_strictly_contains_BD_Shape_float, 364
ppl_BD_Shape_float_swap, 363
ppl_BD_Shape_float_time_elapse_assign, 364
ppl_BD_Shape_float_topological_closure_assign, 363
ppl_BD_Shape_float_total_memory_in_bytes, 366
ppl_BD_Shape_float_unconstrain_space_dimension, 365
ppl_BD_Shape_float_unconstrain_space_dimensions, 365
ppl_BD_Shape_float_upper_bound_assign, 364
ppl_BD_Shape_float_upper_bound_assign_if_exact, 364
ppl_BD_Shape_float_widening_assign, 366
ppl_BD_Shape_float_widening_assign_with_tokens, 366
ppl_BD_Shape_float_wrap_assign, 367
ppl_BD_Shape_int16_t_add_congruence, 101
ppl_BD_Shape_int16_t_add_congruences, 101
ppl_BD_Shape_int16_t_add_constraint, 101
ppl_BD_Shape_int16_t_add_constraints, 101
ppl_BD_Shape_int16_t_add_space_dimensions_and_emb 102
ppl_BD_Shape_int16_t_add_space_dimensions_and_pro 102
ppl_BD_Shape_int16_t_affine_dimension, 100
ppl_BD_Shape_int16_t_affine_image, 102
ppl_BD_Shape_int16_t_affine_preimage, 102
ppl_BD_Shape_int16_t_ascii_dump, 103
ppl_BD_Shape_int16_t_BHMZ05_widening_assign, 103
ppl_BD_Shape_int16_t_BHMZ05_widening_assign_with_ 103
ppl_BD_Shape_int16_t_bounded_affine_image, 102
ppl_BD_Shape_int16_t_bounded_affine_preimage, 102
ppl_BD_Shape_int16_t_bounds_from_above, 100
ppl_BD_Shape_int16_t_bounds_from_below, 100
ppl_BD_Shape_int16_t_CC76_extrapolation_assign, 103
ppl_BD_Shape_int16_t_CC76_extrapolation_assign_wi 103
ppl_BD_Shape_int16_t_CC76_narrowing_assign, 103
ppl_BD_Shape_int16_t_concatenate_assign, 102
ppl_BD_Shape_int16_t_constrains, 102
ppl_BD_Shape_int16_t_contains_BD_Shape_int16_t, 101
ppl_BD_Shape_int16_t_contains_integer_point, 100
ppl_BD_Shape_int16_t_difference_assign, 101
ppl_BD_Shape_int16_t_drop_some_non_integer_points

103
ppl_BD_Shape_int16_t_drop_some_non_integer_points_2,
103
ppl_BD_Shape_int16_t_equals_BD_Shape_int16_t,
101
ppl_BD_Shape_int16_t_expand_space_dimension,
103
ppl_BD_Shape_int16_t_external_memory_in_bytes,
103
ppl_BD_Shape_int16_t_fold_space_dimensions,
103
ppl_BD_Shape_int16_t_frequency, 101
ppl_BD_Shape_int16_t_generalized_affine_image,
102
ppl_BD_Shape_int16_t_generalized_affine_image_lhs_rhs,
102
ppl_BD_Shape_int16_t_generalized_affine_preimage,
102
ppl_BD_Shape_int16_t_generalized_affine_preimage_lhs_rhs,
102
ppl_BD_Shape_int16_t_get_congruences,
100
ppl_BD_Shape_int16_t_get_constraints,
100
ppl_BD_Shape_int16_t_get_minimized_congruences,
100
ppl_BD_Shape_int16_t_get_minimized_constraints,
100
ppl_BD_Shape_int16_t_H79_widening_assign,
103
ppl_BD_Shape_int16_t_H79_widening_assign_with_tokens,
103
ppl_BD_Shape_int16_t_intersection_assign,
101
ppl_BD_Shape_int16_t_is_bounded, 100
ppl_BD_Shape_int16_t_is_discrete,
100
ppl_BD_Shape_int16_t_is_disjoint_from_BD_Shape_int16_t,
101
ppl_BD_Shape_int16_t_is_empty, 100
ppl_BD_Shape_int16_t_is_topologically_closed,
100
ppl_BD_Shape_int16_t_is_universe,
100
ppl_BD_Shape_int16_t_limited_BHMZ05_extrapolation_assign,
103
ppl_BD_Shape_int16_t_limited_BHMZ05_extrapolation_assign_with_tokens,
103
ppl_BD_Shape_int16_t_limited_CC76_extrapolation_assign,
103
ppl_BD_Shape_int16_t_limited_CC76_extrapolation_assign_with_tokens,
103
ppl_BD_Shape_int16_t_limited_H79_extrapolation_assign,
103
ppl_BD_Shape_int16_t_limited_H79_extrapolation_as
103
ppl_BD_Shape_int16_t_linear_partition,
104
ppl_BD_Shape_int16_t_map_space_dimensions,
103
ppl_BD_Shape_int16_t_maximize, 101
ppl_BD_Shape_int16_t_maximize_with_point,
101
ppl_BD_Shape_int16_t_minimize, 101
ppl_BD_Shape_int16_t_minimize_with_point,
101
ppl_BD_Shape_int16_t_OK, 101
ppl_BD_Shape_int16_t_refine_with_congruence,
101
ppl_BD_Shape_int16_t_refine_with_congruences,
101
ppl_BD_Shape_int16_t_refine_with_constraint,
101
ppl_BD_Shape_int16_t_refine_with_constraints,
101
ppl_BD_Shape_int16_t_relation_with_congruence,
100
ppl_BD_Shape_int16_t_relation_with_constraint,
100
ppl_BD_Shape_int16_t_relation_with_generator,
100
ppl_BD_Shape_int16_t_remove_higher_space_dimensi
102
ppl_BD_Shape_int16_t_remove_space_dimensions,
102
ppl_BD_Shape_int16_t_simplify_using_context_assi
102
ppl_BD_Shape_int16_t_space_dimension,
100
ppl_BD_Shape_int16_t_strictly_contains_BD_Shape_
101
ppl_BD_Shape_int16_t_swap, 100
ppl_BD_Shape_int16_t_time_elapse_assign,
102
ppl_BD_Shape_int16_t_topological_closure_assign,
100
ppl_BD_Shape_int16_t_total_memory_in_bytes,
103
ppl_BD_Shape_int16_t_unconstrain_space_dimension,
102
ppl_BD_Shape_int16_t_unconstrain_space_dimensions
102
ppl_BD_Shape_int16_t_upper_bound_assign,
101
ppl_BD_Shape_int16_t_upper_bound_assign_if_exact,
102
ppl_BD_Shape_int16_t_widening_assign,
103

ppl_BD_Shape_int16_t_widening_assign_with_tokens, 103
ppl_BD_Shape_int16_t_wrap_assign, 104
ppl_BD_Shape_int32_t_add_congruence, 109
ppl_BD_Shape_int32_t_add_congruences, 109
ppl_BD_Shape_int32_t_add_constraint, 109
ppl_BD_Shape_int32_t_add_constraints, 109
ppl_BD_Shape_int32_t_add_space_dimensions_and_embed, 110
ppl_BD_Shape_int32_t_add_space_dimensions_and_project, 110
ppl_BD_Shape_int32_t_affine_dimension, 108
ppl_BD_Shape_int32_t_affine_image, 110
ppl_BD_Shape_int32_t_affine_preimage, 110
ppl_BD_Shape_int32_t_ascii_dump, 111
ppl_BD_Shape_int32_t_BHMZ05_widening_assign, 111
ppl_BD_Shape_int32_t_BHMZ05_widening_assign_with_tokens, 111
ppl_BD_Shape_int32_t_bounded_affine_image, 110
ppl_BD_Shape_int32_t_bounded_affine_preimage, 110
ppl_BD_Shape_int32_t_bounds_from_above, 108
ppl_BD_Shape_int32_t_bounds_from_below, 108
ppl_BD_Shape_int32_t_CC76_extrapolation_assign, 111
ppl_BD_Shape_int32_t_CC76_extrapolation_assign_with_tokens, 111
ppl_BD_Shape_int32_t_CC76_narrowing_assign, 111
ppl_BD_Shape_int32_t_concatenate_assign, 109
ppl_BD_Shape_int32_t_constrains, 110
ppl_BD_Shape_int32_t_contains_BD_Shape_int32_t, 109
ppl_BD_Shape_int32_t_contains_integer_point, 108
ppl_BD_Shape_int32_t_difference_assign, 109
ppl_BD_Shape_int32_t_drop_some_non_integer_points, 111
ppl_BD_Shape_int32_t_drop_some_non_integer_points_2, 111
ppl_BD_Shape_int32_t_equals_BD_Shape_int32_t, 109
ppl_BD_Shape_int32_t_expand_space_dimension, 110
ppl_BD_Shape_int32_t_external_memory_in_bytes, 111
ppl_BD_Shape_int32_t_fold_space_dimensions, 110
ppl_BD_Shape_int32_t_frequency, 109
ppl_BD_Shape_int32_t_generalized_affine_image, 110
ppl_BD_Shape_int32_t_generalized_affine_image_lhs
110
ppl_BD_Shape_int32_t_generalized_affine_preimage, 110
ppl_BD_Shape_int32_t_generalized_affine_preimage_ 110
ppl_BD_Shape_int32_t_get_congruences, 108
ppl_BD_Shape_int32_t_get_constraints, 108
ppl_BD_Shape_int32_t_get_minimized_congruences, 108
ppl_BD_Shape_int32_t_get_minimized_constraints, 108
ppl_BD_Shape_int32_t_H79_widening_assign, 111
ppl_BD_Shape_int32_t_H79_widening_assign_with_tol
111
ppl_BD_Shape_int32_t_intersection_assign, 109
ppl_BD_Shape_int32_t_is_bounded, 108
ppl_BD_Shape_int32_t_is_discrete, 108
ppl_BD_Shape_int32_t_is_disjoint_from_BD_Shape_in
109
ppl_BD_Shape_int32_t_is_empty, 108
ppl_BD_Shape_int32_t_is_topologically_closed, 108
ppl_BD_Shape_int32_t_is_universe, 108
ppl_BD_Shape_int32_t_limited_BHMZ05_extrapolation
111
ppl_BD_Shape_int32_t_limited_BHMZ05_extrapolation
111
ppl_BD_Shape_int32_t_limited_CC76_extrapolation_a
111
ppl_BD_Shape_int32_t_limited_CC76_extrapolation_a
111
ppl_BD_Shape_int32_t_limited_H79_extrapolation_as
111
ppl_BD_Shape_int32_t_limited_H79_extrapolation_as
111
ppl_BD_Shape_int32_t_linear_partition,

111
ppl_BD_Shape_int32_t_map_space_dimensions, 110
ppl_BD_Shape_int32_t_maximize, 108
ppl_BD_Shape_int32_t_maximize_with_point, 109
ppl_BD_Shape_int32_t_minimize, 108
ppl_BD_Shape_int32_t_minimize_with_point, 109
ppl_BD_Shape_int32_t_OK, 109
ppl_BD_Shape_int32_t_refine_with_congruence, 109
ppl_BD_Shape_int32_t_refine_with_congruences, 109
ppl_BD_Shape_int32_t_refine_with_constraint, 109
ppl_BD_Shape_int32_t_refine_with_constraints, 109
ppl_BD_Shape_int32_t_relation_with_congruence, 108
ppl_BD_Shape_int32_t_relation_with_constraint, 108
ppl_BD_Shape_int32_t_relation_with_generator, 108
ppl_BD_Shape_int32_t_remove_higher_space_dimensions, 110
ppl_BD_Shape_int32_t_remove_space_dimensions, 110
ppl_BD_Shape_int32_t_simplify_using_context_assign, 110
ppl_BD_Shape_int32_t_space_dimension, 108
ppl_BD_Shape_int32_t_strictly_contains_BD_Shape_int32_t, 109
ppl_BD_Shape_int32_t_swap, 108
ppl_BD_Shape_int32_t_time_elapse_assign, 109
ppl_BD_Shape_int32_t_topological_closure_assign, 108
ppl_BD_Shape_int32_t_total_memory_in_bytes, 111
ppl_BD_Shape_int32_t_unconstrain_space_dimension, 110
ppl_BD_Shape_int32_t_unconstrain_space_dimensions, 110
ppl_BD_Shape_int32_t_upper_bound_assign, 109
ppl_BD_Shape_int32_t_upper_bound_assign_if_exact, 109
ppl_BD_Shape_int32_t_widening_assign, 111
ppl_BD_Shape_int32_t_widening_assign_with_tokens, 111
ppl_BD_Shape_int32_t_wrap_assign, 112
ppl_BD_Shape_int64_t_add_congruence, 117
ppl_BD_Shape_int64_t_add_congruences, 117
ppl_BD_Shape_int64_t_add_constraint, 117
ppl_BD_Shape_int64_t_add_constraints, 117
ppl_BD_Shape_int64_t_add_space_dimensions_and_emb 118
ppl_BD_Shape_int64_t_add_space_dimensions_and_pro 118
ppl_BD_Shape_int64_t_affine_dimension, 116
ppl_BD_Shape_int64_t_affine_image, 118
ppl_BD_Shape_int64_t_affine_preimage, 118
ppl_BD_Shape_int64_t_ascii_dump, 118
ppl_BD_Shape_int64_t_BHMZ05_widening_assign, 119
ppl_BD_Shape_int64_t_BHMZ05_widening_assign_with_ 119
ppl_BD_Shape_int64_t_bounded_affine_image, 118
ppl_BD_Shape_int64_t_bounded_affine_preimage, 118
ppl_BD_Shape_int64_t_bounds_from_above, 116
ppl_BD_Shape_int64_t_bounds_from_below, 116
ppl_BD_Shape_int64_t_CC76_extrapolation_assign, 119
ppl_BD_Shape_int64_t_CC76_extrapolation_assign_wi 119
ppl_BD_Shape_int64_t_CC76_narrowing_assign, 119
ppl_BD_Shape_int64_t_concatenate_assign, 117
ppl_BD_Shape_int64_t_constrains, 117
ppl_BD_Shape_int64_t_contains_BD_Shape_int64_t, 117
ppl_BD_Shape_int64_t_contains_integer_point, 116
ppl_BD_Shape_int64_t_difference_assign, 117
ppl_BD_Shape_int64_t_drop_some_non_integer_points 118
ppl_BD_Shape_int64_t_drop_some_non_integer_points 118
ppl_BD_Shape_int64_t_equals_BD_Shape_int64_t, 117

ppl_BD_Shape_int64_t_expand_space_dimension, 118
ppl_BD_Shape_int64_t_external_memory_in_bytes, 119
ppl_BD_Shape_int64_t_fold_space_dimensions, 118
ppl_BD_Shape_int64_t_frequency, 117
ppl_BD_Shape_int64_t_generalized_affine_image, 118
ppl_BD_Shape_int64_t_generalized_affine_image_lhs_rhs, 118
ppl_BD_Shape_int64_t_generalized_affine_preimage, 118
ppl_BD_Shape_int64_t_generalized_affine_preimage_lhs_rhs, 118
ppl_BD_Shape_int64_t_get_congruences, 116
ppl_BD_Shape_int64_t_get_constraints, 116
ppl_BD_Shape_int64_t_get_minimized_congruences, 116
ppl_BD_Shape_int64_t_get_minimized_constraints, 116
ppl_BD_Shape_int64_t_H79_widening_assign, 119
ppl_BD_Shape_int64_t_H79_widening_assign_with_tokens, 119
ppl_BD_Shape_int64_t_intersection_assign, 117
ppl_BD_Shape_int64_t_is_bounded, 116
ppl_BD_Shape_int64_t_is_discrete, 116
ppl_BD_Shape_int64_t_is_disjoint_from_BD_Shape_int64_t, 117
ppl_BD_Shape_int64_t_is_empty, 116
ppl_BD_Shape_int64_t_is_topologically_closed, 116
ppl_BD_Shape_int64_t_is_universe, 116
ppl_BD_Shape_int64_t_limited_BHMZ05_extrapolation_assign, 119
ppl_BD_Shape_int64_t_limited_BHMZ05_extrapolation_assign_with_tokens, 119
ppl_BD_Shape_int64_t_limited_CC76_extrapolation_assign, 119
ppl_BD_Shape_int64_t_limited_CC76_extrapolation_assign_with_tokens, 119
ppl_BD_Shape_int64_t_limited_H79_extrapolation_assign, 119
ppl_BD_Shape_int64_t_limited_H79_extrapolation_assign_with_tokens, 119
ppl_BD_Shape_int64_t_linear_partition, 119
ppl_BD_Shape_int64_t_map_space_dimensions, 119
ppl_BD_Shape_int64_t_maximize, 116
ppl_BD_Shape_int64_t_maximize_with_point, 116
ppl_BD_Shape_int64_t_minimize, 116
ppl_BD_Shape_int64_t_minimize_with_point, 117
ppl_BD_Shape_int64_t_OK, 117
ppl_BD_Shape_int64_t_refine_with_congruence, 117
ppl_BD_Shape_int64_t_refine_with_congruences, 117
ppl_BD_Shape_int64_t_refine_with_constraint, 117
ppl_BD_Shape_int64_t_refine_with_constraints, 117
ppl_BD_Shape_int64_t_relation_with_congruence, 116
ppl_BD_Shape_int64_t_relation_with_constraint, 116
ppl_BD_Shape_int64_t_relation_with_generator, 116
ppl_BD_Shape_int64_t_remove_higher_space_dimensio 118
ppl_BD_Shape_int64_t_remove_space_dimensions, 118
ppl_BD_Shape_int64_t_simplify_using_context_assio 117
ppl_BD_Shape_int64_t_space_dimension, 116
ppl_BD_Shape_int64_t_strictly_contains_BD_Shape_i 117
ppl_BD_Shape_int64_t_swap, 116
ppl_BD_Shape_int64_t_time_elapse_assign, 117
ppl_BD_Shape_int64_t_topological_closure_assign, 116
ppl_BD_Shape_int64_t_total_memory_in_bytes, 119
ppl_BD_Shape_int64_t_unconstrain_space_dimension, 117
ppl_BD_Shape_int64_t_unconstrain_space_dimensions 118
ppl_BD_Shape_int64_t_upper_bound_assign, 117
ppl_BD_Shape_int64_t_upper_bound_assign_if_exact, 117
ppl_BD_Shape_int64_t_widening_assign, 119
ppl_BD_Shape_int64_t_widening_assign_with_tokens, 119
ppl_BD_Shape_int64_t_wrap_assign,

ppl_BD_Shape_int8_t_add_congruence, 93
ppl_BD_Shape_int8_t_add_congruences, 93
ppl_BD_Shape_int8_t_add_constraint, 93
ppl_BD_Shape_int8_t_add_constraints, 93
ppl_BD_Shape_int8_t_add_space_dimensions_and_embed, 94
ppl_BD_Shape_int8_t_add_space_dimensions_and_project, 95
ppl_BD_Shape_int8_t_affine_dimension, 92
ppl_BD_Shape_int8_t_affine_image, 94
ppl_BD_Shape_int8_t_affine_preimage, 94
ppl_BD_Shape_int8_t_ascii_dump, 95
ppl_BD_Shape_int8_t_BHMZ05_widening_assign, 95
ppl_BD_Shape_int8_t_BHMZ05_widening_assign_with_tokens, 95
ppl_BD_Shape_int8_t_bounded_affine_image, 94
ppl_BD_Shape_int8_t_bounded_affine_preimage, 94
ppl_BD_Shape_int8_t_bounds_from_above, 93
ppl_BD_Shape_int8_t_bounds_from_below, 93
ppl_BD_Shape_int8_t_CC76_extrapolation_assign, 96
ppl_BD_Shape_int8_t_CC76_extrapolation_assign_with_tokens, 96
ppl_BD_Shape_int8_t_CC76_narrowing_assign, 96
ppl_BD_Shape_int8_t_concatenate_assign, 94
ppl_BD_Shape_int8_t_constrains, 94
ppl_BD_Shape_int8_t_contains_BD_Shape_int8_t, 93
ppl_BD_Shape_int8_t_contains_integer_point, 92
ppl_BD_Shape_int8_t_difference_assign, 94
ppl_BD_Shape_int8_t_drop_some_non_integer_points, 95
ppl_BD_Shape_int8_t_drop_some_non_integer_points_2, 95
ppl_BD_Shape_int8_t_equals_BD_Shape_int8_t, 93
ppl_BD_Shape_int8_t_expand_space_dimension, 95
ppl_BD_Shape_int8_t_external_memory_in_bytes, 95
ppl_BD_Shape_int8_t_fold_space_dimensions, 95
ppl_BD_Shape_int8_t_frequency, 93
ppl_BD_Shape_int8_t_generalized_affine_image, 94
ppl_BD_Shape_int8_t_generalized_affine_image_lhs_rhs, 94
ppl_BD_Shape_int8_t_generalized_affine_preimage, 94
ppl_BD_Shape_int8_t_generalized_affine_preimage_lhs_rhs, 94
ppl_BD_Shape_int8_t_get_congruences, 92
ppl_BD_Shape_int8_t_get_constraints, 92
ppl_BD_Shape_int8_t_get_minimized_congruences, 92
ppl_BD_Shape_int8_t_get_minimized_constraints, 92
ppl_BD_Shape_int8_t_H79_widening_assign, 95
ppl_BD_Shape_int8_t_H79_widening_assign_with_tokens, 95
ppl_BD_Shape_int8_t_intersection_assign, 94
ppl_BD_Shape_int8_t_is_bounded, 92
ppl_BD_Shape_int8_t_is_discrete, 93
ppl_BD_Shape_int8_t_is_disjoint_from_BD_Shape_int8_t, 93
ppl_BD_Shape_int8_t_is_empty, 92
ppl_BD_Shape_int8_t_is_topologically_closed, 92
ppl_BD_Shape_int8_t_is_universe, 92
ppl_BD_Shape_int8_t_limited_BHMZ05_extrapolation_assign, 95
ppl_BD_Shape_int8_t_limited_BHMZ05_extrapolation_assign_with_tokens, 95
ppl_BD_Shape_int8_t_limited_CC76_extrapolation_assign, 95
ppl_BD_Shape_int8_t_limited_CC76_extrapolation_assign_with_tokens, 95
ppl_BD_Shape_int8_t_limited_H79_extrapolation_assign, 95
ppl_BD_Shape_int8_t_limited_H79_extrapolation_assign_with_tokens, 95
ppl_BD_Shape_int8_t_linear_partition, 96
ppl_BD_Shape_int8_t_map_space_dimensions, 95
ppl_BD_Shape_int8_t_maximize, 93
ppl_BD_Shape_int8_t_maximize_with_point, 93
ppl_BD_Shape_int8_t_minimize, 93

ppl_BD_Shape_int8_t_minimize_with_point, 93
ppl_BD_Shape_int8_t_OK, 93
ppl_BD_Shape_int8_t_refine_with_congruence, 93
ppl_BD_Shape_int8_t_refine_with_congruences, 93
ppl_BD_Shape_int8_t_refine_with_constraint, 93
ppl_BD_Shape_int8_t_refine_with_constraints, 93
ppl_BD_Shape_int8_t_relation_with_congruence, 92
ppl_BD_Shape_int8_t_relation_with_constraint, 92
ppl_BD_Shape_int8_t_relation_with_generator, 92
ppl_BD_Shape_int8_t_remove_higher_space_dimensions, 95
ppl_BD_Shape_int8_t_remove_space_dimensions, 95
ppl_BD_Shape_int8_t_simplify_using_context_assign, 94
ppl_BD_Shape_int8_t_space_dimension, 92
ppl_BD_Shape_int8_t_strictly_contains_BD_Shape_int8_t, 93
ppl_BD_Shape_int8_t_swap, 92
ppl_BD_Shape_int8_t_time_elapse_assign, 94
ppl_BD_Shape_int8_t_topological_closure_assign, 93
ppl_BD_Shape_int8_t_total_memory_in_bytes, 95
ppl_BD_Shape_int8_t_unconstrain_space_dimension, 94
ppl_BD_Shape_int8_t_unconstrain_space_dimensions, 94
ppl_BD_Shape_int8_t_upper_bound_assign, 94
ppl_BD_Shape_int8_t_upper_bound_assign_if_exact, 94
ppl_BD_Shape_int8_t_widening_assign, 95
ppl_BD_Shape_int8_t_widening_assign_with_tokens, 95
ppl_BD_Shape_int8_t_wrap_assign, 96
ppl_BD_Shape_long_double_add_congruence, 439
ppl_BD_Shape_long_double_add_congruences, 439
ppl_BD_Shape_long_double_add_constraint, 439
ppl_BD_Shape_long_double_add_constraints, 439
ppl_BD_Shape_long_double_add_space_dimensions_and
ppl_BD_Shape_long_double_add_space_dimensions_and
ppl_BD_Shape_long_double_affine_dimension, 437
ppl_BD_Shape_long_double_affine_image, 439
ppl_BD_Shape_long_double_affine_preimage, 439
ppl_BD_Shape_long_double_ascii_dump, 440
ppl_BD_Shape_long_double_BHMZ05_widening_assign, 440
ppl_BD_Shape_long_double_BHMZ05_widening_assign_w
ppl_BD_Shape_long_double_bounded_affine_image, 439
ppl_BD_Shape_long_double_bounded_affine_preimage, 439
ppl_BD_Shape_long_double_bounds_from_above, 438
ppl_BD_Shape_long_double_bounds_from_below, 438
ppl_BD_Shape_long_double_CC76_extrapolation_assig
ppl_BD_Shape_long_double_CC76_extrapolation_assig
ppl_BD_Shape_long_double_CC76_narrowing_assign, 441
ppl_BD_Shape_long_double_concatenate_assign, 439
ppl_BD_Shape_long_double_constrains, 439
ppl_BD_Shape_long_double_contains_BD_Shape_long_d
ppl_BD_Shape_long_double_contains_integer_point, 438
ppl_BD_Shape_long_double_difference_assign, 439
ppl_BD_Shape_long_double_drop_some_non_integer_po
ppl_BD_Shape_long_double_drop_some_non_integer_po
ppl_BD_Shape_long_double_equals_BD_Shape_long_dou
ppl_BD_Shape_long_double_expand_space_dimension, 440
ppl_BD_Shape_long_double_external_memory_in_bytes
ppl_BD_Shape_long_double_fold_space_dimensions, 440
ppl_BD_Shape_long_double_frequency,

438
ppl_BD_Shape_long_double_generalized_affine_image,
440
ppl_BD_Shape_long_double_generalized_affine_image_lhs_rhs,
440
ppl_BD_Shape_long_double_generalized_affine_preimage,
440
ppl_BD_Shape_long_double_generalized_affine_preimage_lhs_rhs,
440
ppl_BD_Shape_long_double_get_congruences,
438
ppl_BD_Shape_long_double_get_constraints,
438
ppl_BD_Shape_long_double_get_minimized_congruences,
438
ppl_BD_Shape_long_double_get_minimized_constraints,
438
ppl_BD_Shape_long_double_H79_widening_assign,
441
ppl_BD_Shape_long_double_H79_widening_assign_with_tokens,
440
ppl_BD_Shape_long_double_intersection_assign,
439
ppl_BD_Shape_long_double_is_bounded,
438
ppl_BD_Shape_long_double_is_discrete,
438
ppl_BD_Shape_long_double_is_disjoint_from_BD_Shape_long_double,
438
ppl_BD_Shape_long_double_is_empty,
438
ppl_BD_Shape_long_double_is_topologically_closed,
438
ppl_BD_Shape_long_double_is_universe,
438
ppl_BD_Shape_long_double_limited_BHMZ05_extrapolation_assign,
441
ppl_BD_Shape_long_double_limited_BHMZ05_extrapolation_assign_with_tokens,
441
ppl_BD_Shape_long_double_limited_CC76_extrapolation_assign,
441
ppl_BD_Shape_long_double_limited_CC76_extrapolation_assign_with_tokens,
441
ppl_BD_Shape_long_double_limited_H79_extrapolation_assign,
441
ppl_BD_Shape_long_double_limited_H79_extrapolation_assign_with_tokens,
441
ppl_BD_Shape_long_double_linear_partition,
441
ppl_BD_Shape_long_double_map_space_dimensions,
440
ppl_BD_Shape_long_double_maximize,
438
ppl_BD_Shape_long_double_maximize_with_point,
438
ppl_BD_Shape_long_double_minimize,
438
ppl_BD_Shape_long_double_minimize_with_point,
438
ppl_BD_Shape_long_double_OK,
438
ppl_BD_Shape_long_double_refine_with_congruence,
439
ppl_BD_Shape_long_double_refine_with_congruences,
439
ppl_BD_Shape_long_double_refine_with_constraint,
439
ppl_BD_Shape_long_double_refine_with_constraints,
439
ppl_BD_Shape_long_double_relation_with_congruence
437
ppl_BD_Shape_long_double_relation_with_constraint
437
ppl_BD_Shape_long_double_relation_with_generator,
437
ppl_BD_Shape_long_double_remove_higher_space_dime
440
ppl_BD_Shape_long_double_remove_space_dimensions,
440
ppl_BD_Shape_long_double_simplify_using_context_a
439
ppl_BD_Shape_long_double_space_dimension,
437
ppl_BD_Shape_long_double_strictly_contains_BD_Sha
438
ppl_BD_Shape_long_double_swap,
437
ppl_BD_Shape_long_double_time_elapse_assign,
439
ppl_BD_Shape_long_double_topological_closure_assi
438
ppl_BD_Shape_long_double_total_memory_in_bytes,
440
ppl_BD_Shape_long_double_unconstrain_space_dimens
439
ppl_BD_Shape_long_double_unconstrain_space_dimens
439
ppl_BD_Shape_long_double_upper_bound_assign,
439
ppl_BD_Shape_long_double_upper_bound_assign_if_ex
439
ppl_BD_Shape_long_double_widening_assign,
441
ppl_BD_Shape_long_double_widening_assign_with_tok
441
ppl_BD_Shape_long_double_wrap_assign,
441
ppl_BD_Shape_mpq_class_add_congruence,
133
ppl_BD_Shape_mpq_class_add_congruences,

133
ppl_BD_Shape_mpq_class_add_constraint,
133
ppl_BD_Shape_mpq_class_add_constraints,
133
ppl_BD_Shape_mpq_class_add_space_dimensions_and_embed,
134
ppl_BD_Shape_mpq_class_add_space_dimensions_and_project,
134
ppl_BD_Shape_mpq_class_affine_dimension,
132
ppl_BD_Shape_mpq_class_affine_image,
134
ppl_BD_Shape_mpq_class_affine_preimage,
134
ppl_BD_Shape_mpq_class_ascii_dump,
135
ppl_BD_Shape_mpq_class_BHMZ05_widening_assign,
135
ppl_BD_Shape_mpq_class_BHMZ05_widening_assign_with_tokens,
135
ppl_BD_Shape_mpq_class_bounded_affine_image,
134
ppl_BD_Shape_mpq_class_bounded_affine_preimage,
134
ppl_BD_Shape_mpq_class_bounds_from_above,
132
ppl_BD_Shape_mpq_class_bounds_from_below,
133
ppl_BD_Shape_mpq_class_CC76_extrapolation_assign,
136
ppl_BD_Shape_mpq_class_CC76_extrapolation_assign_with_tokens,
135
ppl_BD_Shape_mpq_class_CC76_narrowing_assign,
136
ppl_BD_Shape_mpq_class_concatenate_assign,
134
ppl_BD_Shape_mpq_class_constrains,
134
ppl_BD_Shape_mpq_class_contains_BD_Shape_mpq_class,
133
ppl_BD_Shape_mpq_class_contains_integer_point,
132
ppl_BD_Shape_mpq_class_difference_assign,
134
ppl_BD_Shape_mpq_class_drop_some_non_integer_points,
135
ppl_BD_Shape_mpq_class_drop_some_non_integer_points_2,
135
ppl_BD_Shape_mpq_class_equals_BD_Shape_mpq_class,
133
ppl_BD_Shape_mpq_class_expand_space_dimension,
135
ppl_BD_Shape_mpq_class_external_memory_in_bytes,
135
ppl_BD_Shape_mpq_class_fold_space_dimensions,
135
ppl_BD_Shape_mpq_class_frequency,
133
ppl_BD_Shape_mpq_class_generalized_affine_image,
134
ppl_BD_Shape_mpq_class_generalized_affine_image_lhs_rhs,
134
ppl_BD_Shape_mpq_class_generalized_affine_preimage,
134
ppl_BD_Shape_mpq_class_generalized_affine_preimage_lhs_rhs,
134
ppl_BD_Shape_mpq_class_get_congruences,
132
ppl_BD_Shape_mpq_class_get_constraints,
132
ppl_BD_Shape_mpq_class_get_minimized_congruences,
132
ppl_BD_Shape_mpq_class_get_minimized_constraints,
132
ppl_BD_Shape_mpq_class_H79_widening_assign,
135
ppl_BD_Shape_mpq_class_H79_widening_assign_with_tokens,
135
ppl_BD_Shape_mpq_class_intersection_assign,
133
ppl_BD_Shape_mpq_class_is_bounded,
132
ppl_BD_Shape_mpq_class_is_discrete,
132
ppl_BD_Shape_mpq_class_is_disjoint_from_BD_Shape_mpq_class,
133
ppl_BD_Shape_mpq_class_is_empty,
132
ppl_BD_Shape_mpq_class_is_topologically_closed,
132
ppl_BD_Shape_mpq_class_is_universe,
132
ppl_BD_Shape_mpq_class_limited_BHMZ05_extrapolation_assign,
135
ppl_BD_Shape_mpq_class_limited_BHMZ05_extrapolation_assign_with_tokens,
135
ppl_BD_Shape_mpq_class_limited_CC76_extrapolation_assign,
135
ppl_BD_Shape_mpq_class_limited_CC76_extrapolation_assign_with_tokens,
135
ppl_BD_Shape_mpq_class_limited_H79_extrapolation_assign,
135
ppl_BD_Shape_mpq_class_linear_partition,
136
ppl_BD_Shape_mpq_class_map_space_dimensions,
135

ppl_BD_Shape_mpq_class_maximize, 133
ppl_BD_Shape_mpq_class_maximize_with_point, 133
ppl_BD_Shape_mpq_class_minimize, 133
ppl_BD_Shape_mpq_class_minimize_with_point, 133
ppl_BD_Shape_mpq_class_OK, 133
ppl_BD_Shape_mpq_class_refine_with_congruence, 133
ppl_BD_Shape_mpq_class_refine_with_congruences, 133
ppl_BD_Shape_mpq_class_refine_with_constraint, 133
ppl_BD_Shape_mpq_class_refine_with_constraints, 133
ppl_BD_Shape_mpq_class_relation_with_congruence, 132
ppl_BD_Shape_mpq_class_relation_with_constraint, 132
ppl_BD_Shape_mpq_class_relation_with_generator, 132
ppl_BD_Shape_mpq_class_remove_higher_space_dimensions, 135
ppl_BD_Shape_mpq_class_remove_space_dimensions, 134
ppl_BD_Shape_mpq_class_simplify_using_context_assign, 134
ppl_BD_Shape_mpq_class_space_dimension, 132
ppl_BD_Shape_mpq_class_strictly_contains_BD_Shape_mpq_class, 133
ppl_BD_Shape_mpq_class_swap, 132
ppl_BD_Shape_mpq_class_time_elapse_assign, 134
ppl_BD_Shape_mpq_class_topological_closure_assign, 132
ppl_BD_Shape_mpq_class_total_memory_in_bytes, 135
ppl_BD_Shape_mpq_class_unconstrain_space_dimension, 134
ppl_BD_Shape_mpq_class_unconstrain_space_dimensions, 134
ppl_BD_Shape_mpq_class_upper_bound_assign, 133
ppl_BD_Shape_mpq_class_upper_bound_assign_if_exact, 134
ppl_BD_Shape_mpq_class_widening_assign, 135
ppl_BD_Shape_mpq_class_widening_assign_with_tokens, 135
ppl_BD_Shape_mpq_class_wrap_assign, 136
ppl_BD_Shape_mpz_class_add_congruence, 125
ppl_BD_Shape_mpz_class_add_congruences, 125
ppl_BD_Shape_mpz_class_add_constraint, 125
ppl_BD_Shape_mpz_class_add_constraints, 125
ppl_BD_Shape_mpz_class_add_space_dimensions_and_e 126
ppl_BD_Shape_mpz_class_add_space_dimensions_and_p 126
ppl_BD_Shape_mpz_class_affine_dimension, 124
ppl_BD_Shape_mpz_class_affine_image, 126
ppl_BD_Shape_mpz_class_affine_preimage, 126
ppl_BD_Shape_mpz_class_ascii_dump, 127
ppl_BD_Shape_mpz_class_BHMZ05_widening_assign, 127
ppl_BD_Shape_mpz_class_BHMZ05_widening_assign_wit 127
ppl_BD_Shape_mpz_class_bounded_affine_image, 126
ppl_BD_Shape_mpz_class_bounded_affine_preimage, 126
ppl_BD_Shape_mpz_class_bounds_from_above, 124
ppl_BD_Shape_mpz_class_bounds_from_below, 124
ppl_BD_Shape_mpz_class_CC76_extrapolation_assign, 127
ppl_BD_Shape_mpz_class_CC76_extrapolation_assign_ 127
ppl_BD_Shape_mpz_class_CC76_narrowing_assign, 127
ppl_BD_Shape_mpz_class_concatenate_assign, 125
ppl_BD_Shape_mpz_class_constrains, 126
ppl_BD_Shape_mpz_class_contains_BD_Shape_mpz_clas 125
ppl_BD_Shape_mpz_class_contains_integer_point, 124
ppl_BD_Shape_mpz_class_difference_assign, 125
ppl_BD_Shape_mpz_class_drop_some_non_integer_poin 127
ppl_BD_Shape_mpz_class_drop_some_non_integer_poin 127
ppl_BD_Shape_mpz_class_equals_BD_Shape_mpz_class, 125
ppl_BD_Shape_mpz_class_expand_space_dimension, 126

ppl_BD_Shape_mpz_class_external_memory_in_bytes, 127
ppl_BD_Shape_mpz_class_fold_space_dimensions, 126
ppl_BD_Shape_mpz_class_frequency, 125
ppl_BD_Shape_mpz_class_generalized_affine_image, 126
ppl_BD_Shape_mpz_class_generalized_affine_image_lhs_rhs, 126
ppl_BD_Shape_mpz_class_generalized_affine_preimage, 126
ppl_BD_Shape_mpz_class_generalized_affine_preimage_lhs_rhs, 126
ppl_BD_Shape_mpz_class_get_congruences, 124
ppl_BD_Shape_mpz_class_get_constraints, 124
ppl_BD_Shape_mpz_class_get_minimized_congruences, 124
ppl_BD_Shape_mpz_class_get_minimized_constraints, 124
ppl_BD_Shape_mpz_class_H79_widening_assign, 127
ppl_BD_Shape_mpz_class_H79_widening_assign_with_tokens, 127
ppl_BD_Shape_mpz_class_intersection_assign, 125
ppl_BD_Shape_mpz_class_is_bounded, 124
ppl_BD_Shape_mpz_class_is_discrete, 124
ppl_BD_Shape_mpz_class_is_disjoint_from_BD_Shape_mpz_class, 125
ppl_BD_Shape_mpz_class_is_empty, 124
ppl_BD_Shape_mpz_class_is_topologically_closed, 124
ppl_BD_Shape_mpz_class_is_universe, 124
ppl_BD_Shape_mpz_class_limited_BHMZ05_extrapolation_assign, 127
ppl_BD_Shape_mpz_class_limited_BHMZ05_extrapolation_assign_with_tokens, 127
ppl_BD_Shape_mpz_class_limited_CC76_extrapolation_assign, 127
ppl_BD_Shape_mpz_class_limited_CC76_extrapolation_assign_with_tokens, 127
ppl_BD_Shape_mpz_class_limited_H79_extrapolation_assign, 127
ppl_BD_Shape_mpz_class_limited_H79_extrapolation_assign_with_tokens, 127
ppl_BD_Shape_mpz_class_linear_partition, 128
ppl_BD_Shape_mpz_class_map_space_dimensions, 126
ppl_BD_Shape_mpz_class_maximize, 124
ppl_BD_Shape_mpz_class_maximize_with_point, 125
ppl_BD_Shape_mpz_class_minimize, 125
ppl_BD_Shape_mpz_class_minimize_with_point, 125
ppl_BD_Shape_mpz_class_OK, 125
ppl_BD_Shape_mpz_class_refine_with_congruence, 125
ppl_BD_Shape_mpz_class_refine_with_congruences, 125
ppl_BD_Shape_mpz_class_refine_with_constraint, 125
ppl_BD_Shape_mpz_class_refine_with_constraints, 125
ppl_BD_Shape_mpz_class_relation_with_congruence, 124
ppl_BD_Shape_mpz_class_relation_with_constraint, 124
ppl_BD_Shape_mpz_class_relation_with_generator, 124
ppl_BD_Shape_mpz_class_remove_higher_space_dimens 126
ppl_BD_Shape_mpz_class_remove_space_dimensions, 126
ppl_BD_Shape_mpz_class_simplify_using_context_ass 126
ppl_BD_Shape_mpz_class_space_dimension, 124
ppl_BD_Shape_mpz_class_strictly_contains_BD_Shape 125
ppl_BD_Shape_mpz_class_swap, 124
ppl_BD_Shape_mpz_class_time_elapse_assign, 125
ppl_BD_Shape_mpz_class_topological_closure_assign 124
ppl_BD_Shape_mpz_class_total_memory_in_bytes, 127
ppl_BD_Shape_mpz_class_unconstrain_space_dimensio 126
ppl_BD_Shape_mpz_class_unconstrain_space_dimensio 126
ppl_BD_Shape_mpz_class_upper_bound_assign, 125
ppl_BD_Shape_mpz_class_upper_bound_assign_if_exac 125
ppl_BD_Shape_mpz_class_widening_assign, 127
ppl_BD_Shape_mpz_class_widening_assign_with_token 127
ppl_BD_Shape_mpz_class_wrap_assign, 128
ppl_Coefficient_bits, 21

ppl_Coefficient_is_bounded, 21
ppl_Coefficient_max, 21
ppl_Coefficient_min, 22
ppl_Constraints_Product_C_Polyhedron_Grid_add_constraint, 327
ppl_Constraints_Product_C_Polyhedron_Grid_add_constraints, 327
ppl_Constraints_Product_C_Polyhedron_Grid_add_constraints_and_minimize, 327
ppl_Constraints_Product_C_Polyhedron_Grid_add_constraints_and_minimize_with_point, 327
ppl_Constraints_Product_C_Polyhedron_Grid_add_space_dimensions_and_embed, 329
ppl_Constraints_Product_C_Polyhedron_Grid_add_space_dimensions_and_project, 329
ppl_Constraints_Product_C_Polyhedron_Grid_affine_dimension, 326
ppl_Constraints_Product_C_Polyhedron_Grid_affine_image, 328
ppl_Constraints_Product_C_Polyhedron_Grid_affine_preimage, 328
ppl_Constraints_Product_C_Polyhedron_Grid_all_constraints, 329
ppl_Constraints_Product_C_Polyhedron_Grid_bounded_affine_image, 328
ppl_Constraints_Product_C_Polyhedron_Grid_bounded_affine_preimage, 328
ppl_Constraints_Product_C_Polyhedron_Grid_bounds_from_above, 327
ppl_Constraints_Product_C_Polyhedron_Grid_bounds_from_below, 327
ppl_Constraints_Product_C_Polyhedron_Grid_concatenate_assign, 328
ppl_Constraints_Product_C_Polyhedron_Grid_constrains, 328
ppl_Constraints_Product_C_Polyhedron_Grid_constraints, 327
ppl_Constraints_Product_C_Polyhedron_Grid_difference_assign, 328
ppl_Constraints_Product_C_Polyhedron_Grid_drop_some_non_integer_points, 329
ppl_Constraints_Product_C_Polyhedron_Grid_drop_some_non_integer_points_2, 329
ppl_Constraints_Product_C_Polyhedron_Grid_equality_constraints, 327
ppl_Constraints_Product_C_Polyhedron_Grid_expand_space_dimension, 329
ppl_Constraints_Product_C_Polyhedron_Grid_external_memory_in_bytes, 329
ppl_Constraints_Product_C_Polyhedron_Grid_fold_space_dimensions, 329
ppl_Constraints_Product_C_Polyhedron_Grid_generalized_affine_image, 329
ppl_Constraints_Product_C_Polyhedron_Grid_generalized_affine_image_lhs_rhs, 329
ppl_Constraints_Product_C_Polyhedron_Grid_generalized_affine_preimage, 329
ppl_Constraints_Product_C_Polyhedron_Grid_generalized_affine_preimage_lhs_rhs, 329
ppl_Constraints_Product_C_Polyhedron_Grid_generator_system, 329
ppl_Constraints_Product_C_Polyhedron_Grid_generators, 329
ppl_Constraints_Product_C_Polyhedron_Grid_get_constraints, 329
ppl_Constraints_Product_C_Polyhedron_Grid_get_generators, 329
ppl_Constraints_Product_C_Polyhedron_Grid_get_minimized_constraints, 329
ppl_Constraints_Product_C_Polyhedron_Grid_get_minimized_generators, 329
ppl_Constraints_Product_C_Polyhedron_Grid_get_recession_generators, 329
ppl_Constraints_Product_C_Polyhedron_Grid_get_simplified_constraints, 329
ppl_Constraints_Product_C_Polyhedron_Grid_get_simplified_generators, 329
ppl_Constraints_Product_C_Polyhedron_Grid_intersection_assign, 328
ppl_Constraints_Product_C_Polyhedron_Grid_is_bounded, 326
ppl_Constraints_Product_C_Polyhedron_Grid_is_discrete, 326
ppl_Constraints_Product_C_Polyhedron_Grid_is_disjoint_from_C_Polyhedron, 327
ppl_Constraints_Product_C_Polyhedron_Grid_is_empty, 326
ppl_Constraints_Product_C_Polyhedron_Grid_is_topologically_closed, 326
ppl_Constraints_Product_C_Polyhedron_Grid_is_universe, 326
ppl_Constraints_Product_C_Polyhedron_Grid_map_space_dimensions, 329
ppl_Constraints_Product_C_Polyhedron_Grid_maximize, 327
ppl_Constraints_Product_C_Polyhedron_Grid_maximize_with_point, 327
ppl_Constraints_Product_C_Polyhedron_Grid_minimize, 327
ppl_Constraints_Product_C_Polyhedron_Grid_minimize_with_point, 327
ppl_Constraints_Product_C_Polyhedron_Grid_OK, 327
ppl_Constraints_Product_C_Polyhedron_Grid_refine_with_congruence, 328
ppl_Constraints_Product_C_Polyhedron_Grid_refine_with_congruences, 328
ppl_Constraints_Product_C_Polyhedron_Grid_refine_with_constraint, 328
ppl_Constraints_Product_C_Polyhedron_Grid_refine_with_constraints, 328
ppl_Constraints_Product_C_Polyhedron_Grid_relation_with_congruence, 329
ppl_Constraints_Product_C_Polyhedron_Grid_relation_with_constraint, 329
ppl_Constraints_Product_C_Polyhedron_Grid_remove_higher_space_dimensions, 329
ppl_Constraints_Product_C_Polyhedron_Grid_remove_space_dimensions, 329
ppl_Constraints_Product_C_Polyhedron_Grid_space_dimension, 326
ppl_Constraints_Product_C_Polyhedron_Grid_strictly_intersects, 327
ppl_Constraints_Product_C_Polyhedron_Grid_swap, 329

ppl_Constraints_Product_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_drop_sc 326 344
ppl_Constraints_Product_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_drop_sc 328 345
ppl_Constraints_Product_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_equals_ 327 345
ppl_Constraints_Product_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_expand_ 329 343
ppl_Constraints_Product_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_externa 328 345
ppl_Constraints_Product_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_fold_sp 328 345
ppl_Constraints_Product_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_general 328 344
ppl_Constraints_Product_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_general 329 344
ppl_Constraints_Product_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_general 329 344
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_general 343 344
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_interse 343 343
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_is_bour 343 342
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_is_disc 343 342
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_is_disj 344 343
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_is_empt 344 342
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_is_topc 342 342
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_is_univ 344 342
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_map_spa 344 345
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_maximi 345 342
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_maximi 344 342
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_minimi 344 342
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_minimi 342 343
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_OK, 342 343
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_refine_ 344 343
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_refine_ 344 343
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_refine_ 343 343
ppl_Constraints_Product_Grid_C_Polyhedron_ppl_Constraints_Product_Grid_C_Polyhedron_refine_

343 353
ppl_Constraints_Product_Grid_C_Polyhedron_constraints_Product_Grid_NNC_Polyhedron_bound
342 352
ppl_Constraints_Product_Grid_C_Polyhedron_constraints_Product_Grid_NNC_Polyhedron_bound
342 352
ppl_Constraints_Product_Grid_C_Polyhedron_constraints_Product_Grid_NNC_Polyhedron_bound
342 350
ppl_Constraints_Product_Grid_C_Polyhedron_constraints_Product_Grid_NNC_Polyhedron_bound
345 350
ppl_Constraints_Product_Grid_C_Polyhedron_constraints_Product_Grid_NNC_Polyhedron_conca
345 352
ppl_Constraints_Product_Grid_C_Polyhedron_space_dimension,Product_Grid_NNC_Polyhedron_const
342 352
ppl_Constraints_Product_Grid_C_Polyhedron_affine_dimension,Product_Grid_NNC_Polyhedron_Grid_a
343 351
ppl_Constraints_Product_Grid_C_Polyhedron_swap,aints_Product_Grid_NNC_Polyhedron_diffe
342 352
ppl_Constraints_Product_Grid_C_Polyhedron_intersection_assign,Grid_NNC_Polyhedron_drop_
344 353
ppl_Constraints_Product_Grid_C_Polyhedron_topological_closure_assign,Grid_NNC_Polyhedron_drop_
342 353
ppl_Constraints_Product_Grid_C_Polyhedron_constraints_Product_Grid_NNC_Polyhedron_equal
345 351
ppl_Constraints_Product_Grid_C_Polyhedron_unconstrain_space_dimension,Product_Grid_NNC_Polyhedron_expar
344 353
ppl_Constraints_Product_Grid_C_Polyhedron_unconstrain_space_dimensions,Product_Grid_NNC_Polyhedron_exte
344 353
ppl_Constraints_Product_Grid_C_Polyhedron_upper_bound_assign,Grid_NNC_Polyhedron_fold_
343 353
ppl_Constraints_Product_Grid_C_Polyhedron_upper_bound_assign_if_exact,Product_Grid_NNC_Polyhedron_gene
344 352
ppl_Constraints_Product_Grid_C_Polyhedron_widening_assign,Product_Grid_NNC_Polyhedron_gene
345 353
ppl_Constraints_Product_Grid_C_Polyhedron_widening_assign_with_tokens,Product_Grid_NNC_Polyhedron_gene
345 352
ppl_Constraints_Product_Grid_NNC_Polyhedron_add_constraint,Product_Grid_NNC_Polyhedron_gene
351 353
ppl_Constraints_Product_Grid_NNC_Polyhedron_add_constraints,Product_Grid_NNC_Polyhedron_inte
351 352
ppl_Constraints_Product_Grid_NNC_Polyhedron_add_constraint,Product_Grid_NNC_Polyhedron_is_bo
351 350
ppl_Constraints_Product_Grid_NNC_Polyhedron_add_constraints,Product_Grid_NNC_Polyhedron_is_di
351 350
ppl_Constraints_Product_Grid_NNC_Polyhedron_add_space_dimensions_and_embed,Product_Grid_NNC_Polyhedron_is_di
353 351
ppl_Constraints_Product_Grid_NNC_Polyhedron_add_space_dimensions_and_project,Product_Grid_NNC_Polyhedron_is_er
353 350
ppl_Constraints_Product_Grid_NNC_Polyhedron_affine_image,Product_Grid_NNC_Polyhedron_is_to
350 350
ppl_Constraints_Product_Grid_NNC_Polyhedron_affine_preimage,Product_Grid_NNC_Polyhedron_is_un
352 350
ppl_Constraints_Product_Grid_NNC_Polyhedron_bounded_affine_image,Product_Grid_NNC_Polyhedron_map_s
352 353
ppl_Constraints_Product_Grid_NNC_Polyhedron_bounds_from_above,Product_Grid_NNC_Polyhedron_maxim

351 336
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraint_System_minimize_with_point,
351 335
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraint_System_minimize,
351 336
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraint_System_minimize_with_point,
351 337
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_add_s
351 337
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_affin
351 334
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_affin
352 336
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_affin
351 336
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_ascii
351 337
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_bound
350 337
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_bound
350 337
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_bound
350 335
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_bound
353 335
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_conca
353 336
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_const
350 336
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_Gri
351 335
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_diffe
350 336
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_drop_
352 337
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_drop_
350 337
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_equal
353 335
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_expan
352 337
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_exter
352 337
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_fold_
352 337
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_gener
352 337
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_gener
353 337
ppl_Constraints_Product_Grid_NNC_Polyhedron_ppl_Constraints_Product_NNC_Polyhedron_Grid_gener
353 337
ppl_Constraints_Product_NNC_Polyhedron_ppl_Grid_add_constraint_Product_NNC_Polyhedron_Grid_gener
336 337
ppl_Constraints_Product_NNC_Polyhedron_ppl_Grid_add_constraints_Product_NNC_Polyhedron_Grid_inter

336
ppl_Constraints_Product_NNC_Polyhedron_Grid_unconstrained, 337
335
ppl_Constraints_Product_NNC_Polyhedron_Grid_unconstrain_Pre, 336
335
ppl_Constraints_Product_NNC_Polyhedron_Grid_unconstrain_Pre_Pre, 336
335
ppl_Constraints_Product_NNC_Polyhedron_Grid_upper_bound_assign, 336
335
ppl_Constraints_Product_NNC_Polyhedron_Grid_upper_bound_assign_if_exact, 336
335
ppl_Constraints_Product_NNC_Polyhedron_Grid_widening_assign, 338
335
ppl_Constraints_Product_NNC_Polyhedron_Grid_widening_assign_with_tokens, 338
335
ppl_Double_Box_add_dimensions_and_embed, 394
337
ppl_Double_Box_add_dimensions_and_project, 394
335
ppl_Double_Box_add_congruence, 394
335
ppl_Double_Box_add_congruences, 394
335
ppl_Double_Box_add_constraint, 393
335
ppl_Double_Box_add_constraints, 394
335
ppl_Double_Box_add_space_dimensions_and_embed, 395
335
ppl_Double_Box_add_space_dimensions_and_project, 395
335
ppl_Double_Box_affine_image, 392
335
ppl_Double_Box_affine_preimage, 394
335
ppl_Double_Box_ascii_dump, 395
336
ppl_Double_Box_bounded_affine_image, 394
336
ppl_Double_Box_bounded_affine_preimage, 394
336
ppl_Double_Box_bounds_from_above, 393
336
ppl_Double_Box_bounds_from_below, 393
334
ppl_Double_Box_CC76_widening_assign, 395
334
ppl_Double_Box_CC76_widening_assign_with_tokens, 395
334
ppl_Double_Box_concatenate_assign, 394
337
ppl_Double_Box_constrains, 394
337
ppl_Double_Box_contains_Double_Box, 393
337
ppl_Double_Box_contains_integer_point, 393
334
ppl_Double_Box_difference_assign, 394
335
ppl_Double_Box_drop_some_non_integer_points, 395
334
ppl_Double_Box_drop_some_non_integer_points_2, 395
336
ppl_Double_Box_equals_Double_Box, 393
335
ppl_Double_Box_expand_space_dimension, 395
ppl_Double_Box_external_memory_in_bytes,

ppl_Double_Box_external_memory_in_bytes, 395
ppl_Double_Box_fold_space_dimensions, 395
ppl_Double_Box_frequency, 393
ppl_Double_Box_generalized_affine_image, 394
ppl_Double_Box_generalized_affine_image_lhs_rhs, 394
ppl_Double_Box_generalized_affine_preimage, 394
ppl_Double_Box_generalized_affine_preimage_lhs_rhs, 395
ppl_Double_Box_get_congruences, 393
ppl_Double_Box_get_constraints, 393
ppl_Double_Box_get_minimized_congruences, 393
ppl_Double_Box_get_minimized_constraints, 393
ppl_Double_Box_intersection_assign, 394
ppl_Double_Box_is_bounded, 393
ppl_Double_Box_is_discrete, 393
ppl_Double_Box_is_disjoint_from_Double_Box, 393
ppl_Double_Box_is_empty, 393
ppl_Double_Box_is_topologically_closed, 393
ppl_Double_Box_is_universe, 393
ppl_Double_Box_limited_CC76_extrapolation_assign, 395
ppl_Double_Box_limited_CC76_extrapolation_assign_with_tokens, 395
ppl_Double_Box_linear_partition, 395
ppl_Double_Box_map_space_dimensions, 395
ppl_Double_Box_maximize, 393
ppl_Double_Box_maximize_with_point, 393
ppl_Double_Box_minimize, 393
ppl_Double_Box_minimize_with_point, 393
ppl_Double_Box_OK, 393
ppl_Double_Box_refine_with_congruence, 394
ppl_Double_Box_refine_with_congruences, 394
ppl_Double_Box_refine_with_constraint, 394
ppl_Double_Box_refine_with_constraints, 394
ppl_Double_Box_relation_with_congruence, 393
ppl_Double_Box_relation_with_constraint, 392
ppl_Double_Box_relation_with_generator, 393
ppl_Double_Box_remove_higher_space_dimensions, 395
ppl_Double_Box_remove_space_dimensions, 395
ppl_Double_Box_simplify_using_context_assign, 394
ppl_Double_Box_space_dimension, 392
ppl_Double_Box_strictly_contains_Double_Box, 393
ppl_Double_Box_swap, 392
ppl_Double_Box_time_elapse_assign, 394
ppl_Double_Box_topological_closure_assign, 393
ppl_Double_Box_total_memory_in_bytes, 395
ppl_Double_Box_unconstrain_space_dimension, 394
ppl_Double_Box_unconstrain_space_dimensions, 394
ppl_Double_Box_upper_bound_assign, 394
ppl_Double_Box_upper_bound_assign_if_exact, 394
ppl_Double_Box_widening_assign, 395
ppl_Double_Box_widening_assign_with_tokens, 395
ppl_Double_Box_wrap_assign, 395
ppl_Float_Box_add_congruence, 357
ppl_Float_Box_add_congruences, 357
ppl_Float_Box_add_constraint, 357
ppl_Float_Box_add_constraints, 357
ppl_Float_Box_add_space_dimensions_and_embed, 358
ppl_Float_Box_add_space_dimensions_and_project, 358
ppl_Float_Box_affine_dimension, 356
ppl_Float_Box_affine_image, 358
ppl_Float_Box_affine_preimage, 358
ppl_Float_Box_ascii_dump, 359
ppl_Float_Box_bounded_affine_image, 358
ppl_Float_Box_bounded_affine_preimage, 358
ppl_Float_Box_bounds_from_above, 357
ppl_Float_Box_bounds_from_below, 357
ppl_Float_Box_CC76_widening_assign, 359
ppl_Float_Box_CC76_widening_assign_with_tokens, 359

ppl_Float_Box_concatenate_assign, 357
ppl_Float_Box_constrains, 358
ppl_Float_Box_contains_Float_Box, 357
ppl_Float_Box_contains_integer_point, 357
ppl_Float_Box_difference_assign, 357
ppl_Float_Box_drop_some_non_integer_points, 358
ppl_Float_Box_drop_some_non_integer_points_2, 359
ppl_Float_Box_equals_Float_Box, 357
ppl_Float_Box_expand_space_dimension, 358
ppl_Float_Box_external_memory_in_bytes, 359
ppl_Float_Box_fold_space_dimensions, 358
ppl_Float_Box_frequency, 357
ppl_Float_Box_generalized_affine_image, 358
ppl_Float_Box_generalized_affine_image_lhs_rhs, 358
ppl_Float_Box_generalized_affine_preimage, 358
ppl_Float_Box_generalized_affine_preimage_lhs_rhs, 358
ppl_Float_Box_get_congruences, 356
ppl_Float_Box_get_constraints, 356
ppl_Float_Box_get_minimized_congruences, 356
ppl_Float_Box_get_minimized_constraints, 356
ppl_Float_Box_intersection_assign, 357
ppl_Float_Box_is_bounded, 357
ppl_Float_Box_is_discrete, 357
ppl_Float_Box_is_disjoint_from_Float_Box, 357
ppl_Float_Box_is_empty, 356
ppl_Float_Box_is_topologically_closed, 357
ppl_Float_Box_is_universe, 357
ppl_Float_Box_limited_CC76_extrapolation_assign, 359
ppl_Float_Box_limited_CC76_extrapolation_assign_with_tokens, 359
ppl_Float_Box_linear_partition, 359
ppl_Float_Box_map_space_dimensions, 358
ppl_Float_Box_maximize, 357
ppl_Float_Box_maximize_with_point, 357
ppl_Float_Box_minimize, 357
ppl_Float_Box_minimize_with_point, 357
ppl_Float_Box_OK, 357
ppl_Float_Box_refine_with_congruence, 357
ppl_Float_Box_refine_with_congruences, 357
ppl_Float_Box_refine_with_constraint, 357
ppl_Float_Box_refine_with_constraints, 357
ppl_Float_Box_relation_with_congruence, 356
ppl_Float_Box_relation_with_constraint, 356
ppl_Float_Box_relation_with_generator, 356
ppl_Float_Box_remove_higher_space_dimensions, 358
ppl_Float_Box_remove_space_dimensions, 358
ppl_Float_Box_simplify_using_context_assign, 358
ppl_Float_Box_space_dimension, 356
ppl_Float_Box_strictly_contains_Float_Box, 357
ppl_Float_Box_swap, 356
ppl_Float_Box_time_elapse_assign, 358
ppl_Float_Box_topological_closure_assign, 357
ppl_Float_Box_total_memory_in_bytes, 359
ppl_Float_Box_unconstrain_space_dimension, 358
ppl_Float_Box_unconstrain_space_dimensions, 358
ppl_Float_Box_upper_bound_assign, 357
ppl_Float_Box_upper_bound_assign_if_exact, 358
ppl_Float_Box_widening_assign, 359
ppl_Float_Box_widening_assign_with_tokens, 359
ppl_Float_Box_wrap_assign, 359
ppl_Grid_add_congruence, 203
ppl_Grid_add_congruences, 203
ppl_Grid_add_constraint, 203
ppl_Grid_add_constraints, 203
ppl_Grid_add_grid_generator, 203
ppl_Grid_add_grid_generators, 203
ppl_Grid_add_space_dimensions_and_embed, 204

ppl_Grid_add_space_dimensions_and_project, 204
ppl_Grid_affine_dimension, 202
ppl_Grid_affine_image, 203
ppl_Grid_affine_preimage, 203
ppl_Grid_approximate_partition, 205
ppl_Grid_ascii_dump, 204
ppl_Grid_bounded_affine_image, 203
ppl_Grid_bounded_affine_preimage, 203
ppl_Grid_bounds_from_above, 202
ppl_Grid_bounds_from_below, 202
ppl_Grid_concatenate_assign, 203
ppl_Grid_congruence_widening_assign, 204
ppl_Grid_congruence_widening_assign_with_tokens, 204
ppl_Grid_constrains, 203
ppl_Grid_contains_Grid, 202
ppl_Grid_contains_integer_point, 202
ppl_Grid_difference_assign, 203
ppl_Grid_drop_some_non_integer_points, 204
ppl_Grid_drop_some_non_integer_points_2, 204
ppl_Grid_equals_Grid, 203
ppl_Grid_expand_space_dimension, 204
ppl_Grid_external_memory_in_bytes, 204
ppl_Grid_fold_space_dimensions, 204
ppl_Grid_frequency, 202
ppl_Grid_generalized_affine_image, 203
ppl_Grid_generalized_affine_image_lhs_rhs, 203
ppl_Grid_generalized_affine_image_lhs_rhs_with_congruence, 204
ppl_Grid_generalized_affine_image_with_congruence, 204
ppl_Grid_generalized_affine_preimage, 203
ppl_Grid_generalized_affine_preimage_lhs_rhs, 204
ppl_Grid_generalized_affine_preimage_lhs_rhs_with_congruence, 204
ppl_Grid_generalized_affine_preimage_with_congruence, 204
ppl_Grid_generator_widening_assign, 204
ppl_Grid_generator_widening_assign_with_tokens, 204
ppl_Grid_get_congruences, 202
ppl_Grid_get_constraints, 202
ppl_Grid_get_grid_generators, 202
ppl_Grid_get_minimized_congruences, 202
ppl_Grid_get_minimized_constraints, 202
ppl_Grid_get_minimized_grid_generators, 202
ppl_Grid_intersection_assign, 203
ppl_Grid_is_bounded, 202
ppl_Grid_is_discrete, 202
ppl_Grid_is_disjoint_from_Grid, 203
ppl_Grid_is_empty, 202
ppl_Grid_is_topologically_closed, 202
ppl_Grid_is_universe, 202
ppl_Grid_limited_congruence_extrapolation_assign, 205
ppl_Grid_limited_congruence_extrapolation_assign_
204
ppl_Grid_limited_generator_extrapolation_assign, 205
ppl_Grid_limited_generator_extrapolation_assign_w
204
ppl_Grid_map_space_dimensions, 204
ppl_Grid_maximize, 202
ppl_Grid_maximize_with_point, 202
ppl_Grid_minimize, 202
ppl_Grid_minimize_with_point, 202
ppl_Grid_OK, 203
ppl_Grid_refine_with_congruence, 203
ppl_Grid_refine_with_congruences, 203
ppl_Grid_refine_with_constraint, 203
ppl_Grid_refine_with_constraints, 203
ppl_Grid_relation_with_congruence, 202
ppl_Grid_relation_with_constraint, 202
ppl_Grid_relation_with_generator, 202
ppl_Grid_relation_with_grid_generator, 202
ppl_Grid_remove_higher_space_dimensions, 204
ppl_Grid_remove_space_dimensions, 204
ppl_Grid_simplify_using_context_assign, 203
ppl_Grid_space_dimension, 201
ppl_Grid_strictly_contains_Grid, 202
ppl_Grid_swap, 201
ppl_Grid_time_elapse_assign, 203
ppl_Grid_topological_closure_assign, 202

ppl_Grid_total_memory_in_bytes, 204
ppl_Grid_unconstrain_space_dimension, 203
ppl_Grid_unconstrain_space_dimensions, 203
ppl_Grid_upper_bound_assign, 203
ppl_Grid_upper_bound_assign_if_exact, 203
ppl_Grid_widening_assign, 204
ppl_Grid_widening_assign_with_tokens, 204
ppl_Grid_wrap_assign, 205
ppl_Int16_Box_add_congruence, 35
ppl_Int16_Box_add_congruences, 35
ppl_Int16_Box_add_constraint, 35
ppl_Int16_Box_add_constraints, 35
ppl_Int16_Box_add_space_dimensions_and_embed, 36
ppl_Int16_Box_add_space_dimensions_and_project, 36
ppl_Int16_Box_affine_dimension, 34
ppl_Int16_Box_affine_image, 36
ppl_Int16_Box_affine_preimage, 36
ppl_Int16_Box_ascii_dump, 37
ppl_Int16_Box_bounded_affine_image, 36
ppl_Int16_Box_bounded_affine_preimage, 36
ppl_Int16_Box_bounds_from_above, 35
ppl_Int16_Box_bounds_from_below, 35
ppl_Int16_Box_CC76_widening_assign, 37
ppl_Int16_Box_CC76_widening_assign_with_tokens, 37
ppl_Int16_Box_concatenate_assign, 35
ppl_Int16_Box_constrains, 36
ppl_Int16_Box_contains_Int16_Box, 35
ppl_Int16_Box_contains_integer_point, 35
ppl_Int16_Box_difference_assign, 35
ppl_Int16_Box_drop_some_non_integer_points, 36
ppl_Int16_Box_drop_some_non_integer_points_2, 37
ppl_Int16_Box_equals_Int16_Box, 35
ppl_Int16_Box_expand_space_dimension, 36
ppl_Int16_Box_external_memory_in_bytes, 37
ppl_Int16_Box_fold_space_dimensions, 36
ppl_Int16_Box_frequency, 35
ppl_Int16_Box_generalized_affine_image, 36
ppl_Int16_Box_generalized_affine_image_lhs_rhs, 36
ppl_Int16_Box_generalized_affine_preimage, 36
ppl_Int16_Box_generalized_affine_preimage_lhs_rhs, 36
ppl_Int16_Box_get_congruences, 34
ppl_Int16_Box_get_constraints, 34
ppl_Int16_Box_get_minimized_congruences, 34
ppl_Int16_Box_get_minimized_constraints, 34
ppl_Int16_Box_intersection_assign, 35
ppl_Int16_Box_is_bounded, 35
ppl_Int16_Box_is_discrete, 35
ppl_Int16_Box_is_disjoint_from_Int16_Box, 35
ppl_Int16_Box_is_empty, 34
ppl_Int16_Box_is_topologically_closed, 35
ppl_Int16_Box_is_universe, 35
ppl_Int16_Box_limited_CC76_extrapolation_assign, 37
ppl_Int16_Box_limited_CC76_extrapolation_assign_w 37
ppl_Int16_Box_linear_partition, 37
ppl_Int16_Box_map_space_dimensions, 36
ppl_Int16_Box_maximize, 35
ppl_Int16_Box_maximize_with_point, 35
ppl_Int16_Box_minimize, 35
ppl_Int16_Box_minimize_with_point, 35
ppl_Int16_Box_OK, 35
ppl_Int16_Box_refine_with_congruence, 35
ppl_Int16_Box_refine_with_congruences, 35
ppl_Int16_Box_refine_with_constraint, 35
ppl_Int16_Box_refine_with_constraints, 35
ppl_Int16_Box_relation_with_congruence, 34
ppl_Int16_Box_relation_with_constraint, 34
ppl_Int16_Box_relation_with_generator, 34
ppl_Int16_Box_remove_higher_space_dimensions, 36
ppl_Int16_Box_remove_space_dimensions, 36

ppl_Int16_Box_simplify_using_context_assign, 36
ppl_Int16_Box_space_dimension, 34
ppl_Int16_Box_strictly_contains_Int16_Box, 35
ppl_Int16_Box_swap, 34
ppl_Int16_Box_time_elapse_assign, 36
ppl_Int16_Box_topological_closure_assign, 35
ppl_Int16_Box_total_memory_in_bytes, 37
ppl_Int16_Box_unconstrain_space_dimension, 36
ppl_Int16_Box_unconstrain_space_dimensions, 36
ppl_Int16_Box_upper_bound_assign, 35
ppl_Int16_Box_upper_bound_assign_if_exact, 36
ppl_Int16_Box_widening_assign, 37
ppl_Int16_Box_widening_assign_with_tokens, 37
ppl_Int16_Box_wrap_assign, 37
ppl_Int32_Box_add_congruence, 41
ppl_Int32_Box_add_congruences, 42
ppl_Int32_Box_add_constraint, 41
ppl_Int32_Box_add_constraints, 42
ppl_Int32_Box_add_space_dimensions_and_embed, 43
ppl_Int32_Box_add_space_dimensions_and_project, 43
ppl_Int32_Box_affine_dimension, 40
ppl_Int32_Box_affine_image, 42
ppl_Int32_Box_affine_preimage, 42
ppl_Int32_Box_ascii_dump, 43
ppl_Int32_Box_bounded_affine_image, 42
ppl_Int32_Box_bounded_affine_preimage, 42
ppl_Int32_Box_bounds_from_above, 41
ppl_Int32_Box_bounds_from_below, 41
ppl_Int32_Box_CC76_widening_assign, 43
ppl_Int32_Box_CC76_widening_assign_with_tokens, 43
ppl_Int32_Box_concatenate_assign, 42
ppl_Int32_Box_constrains, 42
ppl_Int32_Box_contains_Int32_Box, 41
ppl_Int32_Box_contains_integer_point, 41
ppl_Int32_Box_difference_assign, 42
ppl_Int32_Box_drop_some_non_integer_points, 43
ppl_Int32_Box_drop_some_non_integer_points_2, 43
ppl_Int32_Box_equals_Int32_Box, 41
ppl_Int32_Box_expand_space_dimension, 43
ppl_Int32_Box_external_memory_in_bytes, 43
ppl_Int32_Box_fold_space_dimensions, 43
ppl_Int32_Box_frequency, 41
ppl_Int32_Box_generalized_affine_image, 42
ppl_Int32_Box_generalized_affine_image_lhs_rhs, 42
ppl_Int32_Box_generalized_affine_preimage, 42
ppl_Int32_Box_generalized_affine_preimage_lhs_rhs, 43
ppl_Int32_Box_get_congruences, 41
ppl_Int32_Box_get_constraints, 41
ppl_Int32_Box_get_minimized_congruences, 41
ppl_Int32_Box_get_minimized_constraints, 41
ppl_Int32_Box_intersection_assign, 42
ppl_Int32_Box_is_bounded, 41
ppl_Int32_Box_is_discrete, 41
ppl_Int32_Box_is_disjoint_from_Int32_Box, 41
ppl_Int32_Box_is_empty, 41
ppl_Int32_Box_is_topologically_closed, 41
ppl_Int32_Box_is_universe, 41
ppl_Int32_Box_limited_CC76_extrapolation_assign, 43
ppl_Int32_Box_limited_CC76_extrapolation_assign_w 43
ppl_Int32_Box_linear_partition, 43
ppl_Int32_Box_map_space_dimensions, 43
ppl_Int32_Box_maximize, 41
ppl_Int32_Box_maximize_with_point, 41
ppl_Int32_Box_minimize, 41
ppl_Int32_Box_minimize_with_point, 41
ppl_Int32_Box_OK, 41
ppl_Int32_Box_refine_with_congruence, 42
ppl_Int32_Box_refine_with_congruences, 42
ppl_Int32_Box_refine_with_constraint, 42
ppl_Int32_Box_refine_with_constraints, 42

ppl_Int32_Box_relation_with_congruence, 41
ppl_Int32_Box_relation_with_constraint, 41
ppl_Int32_Box_relation_with_generator, 41
ppl_Int32_Box_remove_higher_space_dimensions, 43
ppl_Int32_Box_remove_space_dimensions, 43
ppl_Int32_Box_simplify_using_context_assign, 42
ppl_Int32_Box_space_dimension, 40
ppl_Int32_Box_strictly_contains_Int32_Box, 41
ppl_Int32_Box_swap, 40
ppl_Int32_Box_time_elapse_assign, 42
ppl_Int32_Box_topological_closure_assign, 41
ppl_Int32_Box_total_memory_in_bytes, 43
ppl_Int32_Box_unconstrain_space_dimension, 42
ppl_Int32_Box_unconstrain_space_dimensions, 42
ppl_Int32_Box_upper_bound_assign, 42
ppl_Int32_Box_upper_bound_assign_if_exact, 42
ppl_Int32_Box_widening_assign, 43
ppl_Int32_Box_widening_assign_with_tokens, 43
ppl_Int32_Box_wrap_assign, 43
ppl_Int64_Box_add_congruence, 48
ppl_Int64_Box_add_congruences, 48
ppl_Int64_Box_add_constraint, 48
ppl_Int64_Box_add_constraints, 48
ppl_Int64_Box_add_space_dimensions_and_embed, 49
ppl_Int64_Box_add_space_dimensions_and_project, 49
ppl_Int64_Box_affine_dimension, 47
ppl_Int64_Box_affine_image, 48
ppl_Int64_Box_affine_preimage, 48
ppl_Int64_Box_ascii_dump, 49
ppl_Int64_Box_bounded_affine_image, 48
ppl_Int64_Box_bounded_affine_preimage, 49
ppl_Int64_Box_bounds_from_above, 47
ppl_Int64_Box_bounds_from_below, 47
ppl_Int64_Box_CC76_widening_assign, 49
ppl_Int64_Box_CC76_widening_assign_with_tokens, 49
ppl_Int64_Box_concatenate_assign, 48
ppl_Int64_Box_constrains, 48
ppl_Int64_Box_contains_Int64_Box, 48
ppl_Int64_Box_contains_integer_point, 47
ppl_Int64_Box_difference_assign, 48
ppl_Int64_Box_drop_some_non_integer_points, 49
ppl_Int64_Box_drop_some_non_integer_points_2, 49
ppl_Int64_Box_equals_Int64_Box, 48
ppl_Int64_Box_expand_space_dimension, 49
ppl_Int64_Box_external_memory_in_bytes, 49
ppl_Int64_Box_fold_space_dimensions, 49
ppl_Int64_Box_frequency, 48
ppl_Int64_Box_generalized_affine_image, 49
ppl_Int64_Box_generalized_affine_image_lhs_rhs, 49
ppl_Int64_Box_generalized_affine_preimage, 49
ppl_Int64_Box_generalized_affine_preimage_lhs_rhs 49
ppl_Int64_Box_get_congruences, 47
ppl_Int64_Box_get_constraints, 47
ppl_Int64_Box_get_minimized_congruences, 47
ppl_Int64_Box_get_minimized_constraints, 47
ppl_Int64_Box_intersection_assign, 48
ppl_Int64_Box_is_bounded, 47
ppl_Int64_Box_is_discrete, 47
ppl_Int64_Box_is_disjoint_from_Int64_Box, 48
ppl_Int64_Box_is_empty, 47
ppl_Int64_Box_is_topologically_closed, 47
ppl_Int64_Box_is_universe, 47
ppl_Int64_Box_limited_CC76_extrapolation_assign, 49
ppl_Int64_Box_limited_CC76_extrapolation_assign_ 49
ppl_Int64_Box_linear_partition, 50
ppl_Int64_Box_map_space_dimensions, 49
ppl_Int64_Box_maximize, 47
ppl_Int64_Box_maximize_with_point, 47
ppl_Int64_Box_minimize, 47

ppl_Int64_Box_minimize_with_point, 48
ppl_Int64_Box_OK, 48
ppl_Int64_Box_refine_with_congruence, 48
ppl_Int64_Box_refine_with_congruences, 48
ppl_Int64_Box_refine_with_constraint, 48
ppl_Int64_Box_refine_with_constraints, 48
ppl_Int64_Box_relation_with_congruence, 47
ppl_Int64_Box_relation_with_constraint, 47
ppl_Int64_Box_relation_with_generator, 47
ppl_Int64_Box_remove_higher_space_dimensions, 49
ppl_Int64_Box_remove_space_dimensions, 49
ppl_Int64_Box_simplify_using_context_assign, 48
ppl_Int64_Box_space_dimension, 47
ppl_Int64_Box_strictly_contains_Int64_Box, 48
ppl_Int64_Box_swap, 47
ppl_Int64_Box_time_elapse_assign, 48
ppl_Int64_Box_topological_closure_assign, 47
ppl_Int64_Box_total_memory_in_bytes, 49
ppl_Int64_Box_unconstrain_space_dimension, 48
ppl_Int64_Box_unconstrain_space_dimensions, 48
ppl_Int64_Box_upper_bound_assign, 48
ppl_Int64_Box_upper_bound_assign_if_exact, 48
ppl_Int64_Box_widening_assign, 49
ppl_Int64_Box_widening_assign_with_tokens, 49
ppl_Int64_Box_wrap_assign, 50
ppl_Int8_Box_add_congruence, 29
ppl_Int8_Box_add_congruences, 29
ppl_Int8_Box_add_constraint, 29
ppl_Int8_Box_add_constraints, 29
ppl_Int8_Box_add_space_dimensions_and_embed, 30
ppl_Int8_Box_add_space_dimensions_and_project, 30
ppl_Int8_Box_affine_dimension, 28
ppl_Int8_Box_affine_image, 30
ppl_Int8_Box_affine_preimage, 30
ppl_Int8_Box_ascii_dump, 30
ppl_Int8_Box_bounded_affine_image, 30
ppl_Int8_Box_bounded_affine_preimage, 30
ppl_Int8_Box_bounds_from_above, 29
ppl_Int8_Box_bounds_from_below, 29
ppl_Int8_Box_CC76_widening_assign, 30
ppl_Int8_Box_CC76_widening_assign_with_tokens, 30
ppl_Int8_Box_concatenate_assign, 29
ppl_Int8_Box_constrains, 29
ppl_Int8_Box_contains_Int8_Box, 29
ppl_Int8_Box_contains_integer_point, 28
ppl_Int8_Box_difference_assign, 29
ppl_Int8_Box_drop_some_non_integer_points, 30
ppl_Int8_Box_drop_some_non_integer_points_2, 30
ppl_Int8_Box_equals_Int8_Box, 29
ppl_Int8_Box_expand_space_dimension, 30
ppl_Int8_Box_external_memory_in_bytes, 30
ppl_Int8_Box_fold_space_dimensions, 30
ppl_Int8_Box_frequency, 29
ppl_Int8_Box_generalized_affine_image, 30
ppl_Int8_Box_generalized_affine_image_lhs_rhs, 30
ppl_Int8_Box_generalized_affine_preimage, 30
ppl_Int8_Box_generalized_affine_preimage_lhs_rhs, 30
ppl_Int8_Box_get_congruences, 28
ppl_Int8_Box_get_constraints, 28
ppl_Int8_Box_get_minimized_congruences, 28
ppl_Int8_Box_get_minimized_constraints, 28
ppl_Int8_Box_intersection_assign, 29
ppl_Int8_Box_is_bounded, 28
ppl_Int8_Box_is_discrete, 28
ppl_Int8_Box_is_disjoint_from_Int8_Box, 29
ppl_Int8_Box_is_empty, 28
ppl_Int8_Box_is_topologically_closed, 28
ppl_Int8_Box_is_universe, 28
ppl_Int8_Box_limited_CC76_extrapolation_assign, 31

ppl_Int8_Box_limited_CC76_extrapolation_assign_with_tokens, 31
ppl_Int8_Box_linear_partition, 31
ppl_Int8_Box_map_space_dimensions, 30
ppl_Int8_Box_maximize, 29
ppl_Int8_Box_maximize_with_point, 29
ppl_Int8_Box_minimize, 29
ppl_Int8_Box_minimize_with_point, 29
ppl_Int8_Box_OK, 29
ppl_Int8_Box_refine_with_congruence, 29
ppl_Int8_Box_refine_with_congruences, 29
ppl_Int8_Box_refine_with_constraint, 29
ppl_Int8_Box_refine_with_constraints, 29
ppl_Int8_Box_relation_with_congruence, 28
ppl_Int8_Box_relation_with_constraint, 28
ppl_Int8_Box_relation_with_generator, 28
ppl_Int8_Box_remove_higher_space_dimensions, 30
ppl_Int8_Box_remove_space_dimensions, 30
ppl_Int8_Box_simplify_using_context_assign, 29
ppl_Int8_Box_space_dimension, 28
ppl_Int8_Box_strictly_contains_Int8_Box, 29
ppl_Int8_Box_swap, 28
ppl_Int8_Box_time_elapse_assign, 29
ppl_Int8_Box_topological_closure_assign, 28
ppl_Int8_Box_total_memory_in_bytes, 30
ppl_Int8_Box_unconstrain_space_dimension, 29
ppl_Int8_Box_unconstrain_space_dimensions, 29
ppl_Int8_Box_upper_bound_assign, 29
ppl_Int8_Box_upper_bound_assign_if_exact, 29
ppl_Int8_Box_widening_assign, 30
ppl_Int8_Box_widening_assign_with_tokens, 30
ppl_Int8_Box_wrap_assign, 31
PPL_internal_error, 19
ppl_io_wrap_string, 21
ppl_irrational_precision, 22
ppl_Linear_Expression_all_homogeneous_terms_are_z 22
ppl_Linear_Expression_is_zero, 22
ppl_Long_Double_Box_add_congruence, 431
ppl_Long_Double_Box_add_congruences, 431
ppl_Long_Double_Box_add_constraint, 431
ppl_Long_Double_Box_add_constraints, 431
ppl_Long_Double_Box_add_space_dimensions_and_embe 432
ppl_Long_Double_Box_add_space_dimensions_and_proj 432
ppl_Long_Double_Box_affine_dimension, 430
ppl_Long_Double_Box_affine_image, 432
ppl_Long_Double_Box_affine_preimage, 432
ppl_Long_Double_Box_ascii_dump, 432
ppl_Long_Double_Box_bounded_affine_image, 432
ppl_Long_Double_Box_bounded_affine_preimage, 432
ppl_Long_Double_Box_bounds_from_above, 430
ppl_Long_Double_Box_bounds_from_below, 430
ppl_Long_Double_Box_CC76_widening_assign, 433
ppl_Long_Double_Box_CC76_widening_assign_with_tok 433
ppl_Long_Double_Box_concatenate_assign, 431
ppl_Long_Double_Box_constrains, 431
ppl_Long_Double_Box_contains_integer_point, 430
ppl_Long_Double_Box_contains_Long_Double_Box, 431
ppl_Long_Double_Box_difference_assign, 431
ppl_Long_Double_Box_drop_some_non_integer_points, 432
ppl_Long_Double_Box_drop_some_non_integer_points_ 432
ppl_Long_Double_Box_equals_Long_Double_Box, 431
ppl_Long_Double_Box_expand_space_dimension, 432
ppl_Long_Double_Box_external_memory_in_bytes, 432
ppl_Long_Double_Box_fold_space_dimensions,

432
ppl_Long_Double_Box_frequency, 431
ppl_Long_Double_Box_generalized_affine_image, 432
ppl_Long_Double_Box_generalized_affine_image_lhs_rhs, 432
ppl_Long_Double_Box_generalized_affine_preimage, 432
ppl_Long_Double_Box_generalized_affine_preimage_lhs_rhs, 432
ppl_Long_Double_Box_get_congruences, 430
ppl_Long_Double_Box_get_constraints, 430
ppl_Long_Double_Box_get_minimized_congruences, 430
ppl_Long_Double_Box_get_minimized_constraints, 430
ppl_Long_Double_Box_intersection_assign, 431
ppl_Long_Double_Box_is_bounded, 430
ppl_Long_Double_Box_is_discrete, 430
ppl_Long_Double_Box_is_disjoint_from_Long_Double_Box, 431
ppl_Long_Double_Box_is_empty, 430
ppl_Long_Double_Box_is_topologically_closed, 430
ppl_Long_Double_Box_is_universe, 430
ppl_Long_Double_Box_limited_CC76_extrapolation_assign, 433
ppl_Long_Double_Box_limited_CC76_extrapolation_assign_with_tokens, 433
ppl_Long_Double_Box_linear_partition, 433
ppl_Long_Double_Box_map_space_dimensions, 432
ppl_Long_Double_Box_maximize, 430
ppl_Long_Double_Box_maximize_with_point, 430
ppl_Long_Double_Box_minimize, 430
ppl_Long_Double_Box_minimize_with_point, 430
ppl_Long_Double_Box_OK, 431
ppl_Long_Double_Box_refine_with_congruence, 431
ppl_Long_Double_Box_refine_with_congruences, 431
ppl_Long_Double_Box_refine_with_constraint, 431
ppl_Long_Double_Box_refine_with_constraints, 431
ppl_Long_Double_Box_relation_with_congruence, 430
ppl_Long_Double_Box_relation_with_constraint, 430
ppl_Long_Double_Box_relation_with_generator, 430
ppl_Long_Double_Box_remove_higher_space_dimensions, 432
ppl_Long_Double_Box_remove_space_dimensions, 432
ppl_Long_Double_Box_simplify_using_context_assign, 431
ppl_Long_Double_Box_space_dimension, 430
ppl_Long_Double_Box_strictly_contains_Long_Double, 431
ppl_Long_Double_Box_swap, 430
ppl_Long_Double_Box_time_elapse_assign, 431
ppl_Long_Double_Box_topological_closure_assign, 430
ppl_Long_Double_Box_total_memory_in_bytes, 432
ppl_Long_Double_Box_unconstrain_space_dimension, 431
ppl_Long_Double_Box_unconstrain_space_dimensions, 431
ppl_Long_Double_Box_upper_bound_assign, 431
ppl_Long_Double_Box_upper_bound_assign_if_exact, 431
ppl_Long_Double_Box_widening_assign, 433
ppl_Long_Double_Box_widening_assign_with_tokens, 433
ppl_Long_Double_Box_wrap_assign, 433
ppl_max_space_dimension, 21
ppl_MIP_Problem_add_constraint, 22
ppl_MIP_Problem_add_constraints, 22
ppl_MIP_Problem_add_space_dimensions_and_embed, 22
ppl_MIP_Problem_add_to_integer_space_dimensions, 22
ppl_MIP_Problem_ascii_dump, 23
ppl_MIP_Problem_clear, 22
ppl_MIP_Problem_constraints, 22
ppl_MIP_Problem_evaluate_objective_function, 22
ppl_MIP_Problem_feasible_point, 22
ppl_MIP_Problem_get_control_parameter, 23
ppl_MIP_Problem_integer_space_dimensions, 22
ppl_MIP_Problem_is_satisfiable, 22
ppl_MIP_Problem_objective_function, 22

ppl_MIP_Problem_OK, 22
ppl_MIP_Problem_optimal_value, 22
ppl_MIP_Problem_optimization_mode, 22
ppl_MIP_Problem_optimizing_point, 22
ppl_MIP_Problem_set_control_parameter, 22
ppl_MIP_Problem_set_objective_function, 22
ppl_MIP_Problem_set_optimization_mode, 22
ppl_MIP_Problem_solve, 22
ppl_MIP_Problem_space_dimension, 22
ppl_MIP_Problem_swap, 23
ppl_new_BD_Shape_double_from_BD_Shape_double, 397
ppl_new_BD_Shape_double_from_BD_Shape_double_with_complexity, 399
ppl_new_BD_Shape_double_from_BD_Shape_float, 397
ppl_new_BD_Shape_double_from_BD_Shape_float_with_complexity, 399
ppl_new_BD_Shape_double_from_BD_Shape_int16_t, 396
ppl_new_BD_Shape_double_from_BD_Shape_int16_t_with_complexity, 398
ppl_new_BD_Shape_double_from_BD_Shape_int32_t, 396
ppl_new_BD_Shape_double_from_BD_Shape_int32_t_with_complexity, 398
ppl_new_BD_Shape_double_from_BD_Shape_int64_t, 396
ppl_new_BD_Shape_double_from_BD_Shape_int64_t_with_complexity, 398
ppl_new_BD_Shape_double_from_BD_Shape_int8_t, 396
ppl_new_BD_Shape_double_from_BD_Shape_int8_t_with_complexity, 398
ppl_new_BD_Shape_double_from_BD_Shape_long_double, 396
ppl_new_BD_Shape_double_from_BD_Shape_long_double_with_complexity, 398
ppl_new_BD_Shape_double_from_C_Polyhedron, 397
ppl_new_BD_Shape_double_from_C_Polyhedron_with_complexity, 398
ppl_new_BD_Shape_double_from_congruences, 399
ppl_new_BD_Shape_double_from_constraints, 399
ppl_new_BD_Shape_double_from_Double_Box, 397
ppl_new_BD_Shape_double_from_Double_Box_with_comp
ppl_new_BD_Shape_double_from_Float_Box, 397
ppl_new_BD_Shape_double_from_Float_Box_with_compl
ppl_new_BD_Shape_double_from_generators, 399
ppl_new_BD_Shape_double_from_Grid, 397
ppl_new_BD_Shape_double_from_Grid_with_complexity
ppl_new_BD_Shape_double_from_Int16_Box, 396
ppl_new_BD_Shape_double_from_Int16_Box_with_compl
ppl_new_BD_Shape_double_from_Int32_Box, 396
ppl_new_BD_Shape_double_from_Int32_Box_with_compl
ppl_new_BD_Shape_double_from_Int64_Box, 396
ppl_new_BD_Shape_double_from_Int64_Box_with_compl
ppl_new_BD_Shape_double_from_Int8_Box, 396
ppl_new_BD_Shape_double_from_Int8_Box_with_comple
ppl_new_BD_Shape_double_from_Long_Double_Box, 397
ppl_new_BD_Shape_double_from_Long_Double_Box_witl
ppl_new_BD_Shape_double_from_NNC_Polyhedron, 397
ppl_new_BD_Shape_double_from_NNC_Polyhedron_with_
ppl_new_BD_Shape_double_from_Octagonal_Shape_doub
ppl_new_BD_Shape_double_from_Octagonal_Shape_doub
ppl_new_BD_Shape_double_from_Octagonal_Shape_floa
ppl_new_BD_Shape_double_from_Octagonal_Shape_floa
ppl_new_BD_Shape_double_from_Octagonal_Shape_intl
ppl_new_BD_Shape_double_from_Octagonal_Shape_intl

ppl_new_BD_Shape_double_from_Octagonal... 397
ppl_new_BD_Shape_double_from_Octagonal... 398
ppl_new_BD_Shape_double_from_Octagonal... 397
ppl_new_BD_Shape_double_from_Octagonal... 398
ppl_new_BD_Shape_double_from_Octagonal... 397
ppl_new_BD_Shape_double_from_Octagonal... 398
ppl_new_BD_Shape_double_from_Octagonal... 397
ppl_new_BD_Shape_double_from_Octagonal... 399
ppl_new_BD_Shape_double_from_Octagonal... 397
ppl_new_BD_Shape_double_from_Octagonal... 398
ppl_new_BD_Shape_double_from_Octagonal... 397
ppl_new_BD_Shape_double_from_Octagonal... 398
ppl_new_BD_Shape_double_from_Rational_Box, 396
ppl_new_BD_Shape_double_from_Rational_Box... 398
ppl_new_BD_Shape_double_from_space_dimension, 396
ppl_new_BD_Shape_double_from_Uint16_Box, 396
ppl_new_BD_Shape_double_from_Uint16_Box... 397
ppl_new_BD_Shape_double_from_Uint32_Box, 396
ppl_new_BD_Shape_double_from_Uint32_Box... 398
ppl_new_BD_Shape_double_from_Uint64_Box, 396
ppl_new_BD_Shape_double_from_Uint64_Box... 398
ppl_new_BD_Shape_double_from_Uint8_Box, 396
ppl_new_BD_Shape_double_from_Uint8_Box... 397
ppl_new_BD_Shape_double_from_Z_Box, 396
ppl_new_BD_Shape_double_from_Z_Box_with_... 398
ppl_new_BD_Shape_float_from_BD_Shape... 361
ppl_new_BD_Shape_float_from_BD_Shape... 362
ppl_new_BD_Shape_float_from_BD_Shape_float, 360
ppl_new_BD_Shape_float_from_BD_Shape_float_with_... 362
ppl_new_BD_Shape_float_from_BD_Shape_int16_t, 360
ppl_new_BD_Shape_float_from_BD_Shape_int16_t_with... 361
ppl_new_BD_Shape_float_from_BD_Shape_int32_t, 360
ppl_new_BD_Shape_float_from_BD_Shape_int32_t_with... 361
ppl_new_BD_Shape_float_from_BD_Shape_int64_t, 360
ppl_new_BD_Shape_float_from_BD_Shape_int64_t_with... 361
ppl_new_BD_Shape_float_from_BD_Shape_int8_t, 360
ppl_new_BD_Shape_float_from_BD_Shape_int8_t_with... 361
ppl_new_BD_Shape_float_from_BD_Shape_long_double, 361
ppl_new_BD_Shape_float_from_BD_Shape_long_double... 363
ppl_new_BD_Shape_float_from_BD_Shape_mpq_class, 360
ppl_new_BD_Shape_float_from_BD_Shape_mpq_class_wi... 362
ppl_new_BD_Shape_float_from_BD_Shape_mpz_class, 360
ppl_new_BD_Shape_float_from_BD_Shape_mpz_class_wi... 362
ppl_new_BD_Shape_float_from_C_Polyhedron, 360
ppl_new_BD_Shape_float_from_C_Polyhedron_with_co... 362
ppl_new_BD_Shape_float_from_congruences, 363
ppl_new_BD_Shape_float_from_constraints, 363
ppl_new_BD_Shape_float_from_Double_Box, 361
ppl_new_BD_Shape_float_from_Double_Box_with_compl... 362
ppl_new_BD_Shape_float_from_Float_Box, 360
ppl_new_BD_Shape_float_from_Float_Box_with_comple... 362
ppl_new_BD_Shape_float_from_generators, 363
ppl_new_BD_Shape_float_from_Grid, 360
ppl_new_BD_Shape_float_from_Grid_with_complexity, 362

ppl_new_BD_Shape_float_from_Int16_Box, 360
ppl_new_BD_Shape_float_from_Int16_Box_with_complexity, 361
ppl_new_BD_Shape_float_from_Int32_Box, 360
ppl_new_BD_Shape_float_from_Int32_Box_with_complexity, 361
ppl_new_BD_Shape_float_from_Int64_Box, 360
ppl_new_BD_Shape_float_from_Int64_Box_with_complexity, 361
ppl_new_BD_Shape_float_from_Int8_Box, 360
ppl_new_BD_Shape_float_from_Int8_Box_with_complexity, 361
ppl_new_BD_Shape_float_from_Long_Double_Box, 361
ppl_new_BD_Shape_float_from_Long_Double_Box_with_complexity, 363
ppl_new_BD_Shape_float_from_NNC_Polyhedron, 360
ppl_new_BD_Shape_float_from_NNC_Polyhedron_with_complexity, 362
ppl_new_BD_Shape_float_from_Octagonal_Shape_double, 361
ppl_new_BD_Shape_float_from_Octagonal_Shape_double_with_complexity, 362
ppl_new_BD_Shape_float_from_Octagonal_Shape_float, 360
ppl_new_BD_Shape_float_from_Octagonal_Shape_float_with_complexity, 362
ppl_new_BD_Shape_float_from_Octagonal_Shape_int16_t, 360
ppl_new_BD_Shape_float_from_Octagonal_Shape_int16_t_with_complexity, 362
ppl_new_BD_Shape_float_from_Octagonal_Shape_int32_t, 360
ppl_new_BD_Shape_float_from_Octagonal_Shape_int32_t_with_complexity, 362
ppl_new_BD_Shape_float_from_Octagonal_Shape_int64_t, 361
ppl_new_BD_Shape_float_from_Octagonal_Shape_int64_t_with_complexity, 363
ppl_new_BD_Shape_float_from_Octagonal_Shape_int8_t, 360
ppl_new_BD_Shape_float_from_Octagonal_Shape_mpq_class, 362
ppl_new_BD_Shape_float_from_Octagonal_Shape_mpz_class, 360
ppl_new_BD_Shape_float_from_Octagonal_Shape_mpz_class_with_complexity, 362
ppl_new_BD_Shape_float_from_Rational_Box, 360
ppl_new_BD_Shape_float_from_Rational_Box_with_complexity, 361
ppl_new_BD_Shape_float_from_space_dimension, 360
ppl_new_BD_Shape_float_from_Uint16_Box, 360
ppl_new_BD_Shape_float_from_Uint16_Box_with_complexity, 361
ppl_new_BD_Shape_float_from_Uint32_Box, 360
ppl_new_BD_Shape_float_from_Uint32_Box_with_complexity, 361
ppl_new_BD_Shape_float_from_Uint64_Box, 360
ppl_new_BD_Shape_float_from_Uint64_Box_with_complexity, 361
ppl_new_BD_Shape_float_from_Uint8_Box, 360
ppl_new_BD_Shape_float_from_Uint8_Box_with_complexity, 361
ppl_new_BD_Shape_float_from_Z_Box, 360
ppl_new_BD_Shape_float_from_Z_Box_with_complexity, 361
ppl_new_BD_Shape_int16_t_from_BD_Shape_double, 98
ppl_new_BD_Shape_int16_t_from_BD_Shape_double_with_complexity, 99
ppl_new_BD_Shape_int16_t_from_BD_Shape_float, 97
ppl_new_BD_Shape_int16_t_from_BD_Shape_float_with_complexity, 99
ppl_new_BD_Shape_int16_t_from_BD_Shape_int16_t, 97
ppl_new_BD_Shape_int16_t_from_BD_Shape_int16_t_with_complexity, 98
ppl_new_BD_Shape_int16_t_from_BD_Shape_int32_t, 97
ppl_new_BD_Shape_int16_t_from_BD_Shape_int32_t_with_complexity, 98
ppl_new_BD_Shape_int16_t_from_BD_Shape_int64_t, 97
ppl_new_BD_Shape_int16_t_from_BD_Shape_int64_t_with_complexity, 99
ppl_new_BD_Shape_int16_t_from_BD_Shape_int8_t, 97

ppl_new_BD_Shape_int16_t_from_BD_Shape_int8_t, 98
ppl_new_BD_Shape_int16_t_from_BD_Shape_int8_t_with_complexity, 100
ppl_new_BD_Shape_int16_t_from_BD_Shape_long_double, 98
ppl_new_BD_Shape_int16_t_from_BD_Shape_mpq_class, 97
ppl_new_BD_Shape_int16_t_from_BD_Shape_mpz_class, 100
ppl_new_BD_Shape_int16_t_from_C_Polyhedron, 97
ppl_new_BD_Shape_int16_t_from_congruences, 100
ppl_new_BD_Shape_int16_t_from_constraints, 100
ppl_new_BD_Shape_int16_t_from_Double_Box, 97
ppl_new_BD_Shape_int16_t_from_Float_Box, 97
ppl_new_BD_Shape_int16_t_from_generators, 100
ppl_new_BD_Shape_int16_t_from_Grid, 97
ppl_new_BD_Shape_int16_t_from_Grid_with_complexity, 99
ppl_new_BD_Shape_int16_t_from_Int16_Box, 97
ppl_new_BD_Shape_int16_t_from_Int16_Box_with_complexity, 98
ppl_new_BD_Shape_int16_t_from_Int32_Box, 97
ppl_new_BD_Shape_int16_t_from_Int32_Box_with_complexity, 98
ppl_new_BD_Shape_int16_t_from_Int64_Box, 97
ppl_new_BD_Shape_int16_t_from_Int64_Box_with_complexity, 98
ppl_new_BD_Shape_int16_t_from_Int8_Box, 97
ppl_new_BD_Shape_int16_t_from_Int8_Box_with_complexity, 98
ppl_new_BD_Shape_int16_t_from_Long_Double_Box, 98
ppl_new_BD_Shape_int16_t_from_Long_Double_Box_with_complexity, 100
ppl_new_BD_Shape_int16_t_from_NNC_Polyhedron, 97
ppl_new_BD_Shape_int16_t_from_NNC_Polyhedron_with_complexity, 99
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_double, 98
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_double_with_complexity, 100
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_float, 97
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_float_with_complexity, 99
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int16_t, 97
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int16_t_with_complexity, 99
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int32_t, 97
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int32_t_with_complexity, 99
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int64_t, 97
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int64_t_with_complexity, 99
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int8_t, 97
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int8_t_with_complexity, 99
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_long_double, 98
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_long_double_with_complexity, 100
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_mpq_class, 97
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_mpq_class_with_complexity, 99
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_mpz_class, 97
ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_mpz_class_with_complexity, 99
ppl_new_BD_Shape_int16_t_from_Rational_Box, 97
ppl_new_BD_Shape_int16_t_from_Rational_Box_with_complexity, 98
ppl_new_BD_Shape_int16_t_from_space_dimension, 97
ppl_new_BD_Shape_int16_t_from_Uint16_Box, 97
ppl_new_BD_Shape_int16_t_from_Uint16_Box_with_complexity, 98
ppl_new_BD_Shape_int16_t_from_Uint32_Box, 97

ppl_new_BD_Shape_int16_t_from_Uint32, 98
ppl_new_BD_Shape_int16_t_from_Uint64, 97
ppl_new_BD_Shape_int16_t_from_Uint64, 98
ppl_new_BD_Shape_int16_t_from_Uint8, 97
ppl_new_BD_Shape_int16_t_from_Uint8, 98
ppl_new_BD_Shape_int16_t_from_Z_Box, 97
ppl_new_BD_Shape_int16_t_from_Z_Box, 98
ppl_new_BD_Shape_int32_t_from_BD_Shape, 105
ppl_new_BD_Shape_int32_t_from_BD_Shape, 107
ppl_new_BD_Shape_int32_t_from_BD_Shape, 105
ppl_new_BD_Shape_int32_t_from_BD_Shape, 107
ppl_new_BD_Shape_int32_t_from_BD_Shape, 105
ppl_new_BD_Shape_int32_t_from_BD_Shape, 106
ppl_new_BD_Shape_int32_t_from_BD_Shape, 105
ppl_new_BD_Shape_int32_t_from_BD_Shape, 106
ppl_new_BD_Shape_int32_t_from_BD_Shape, 105
ppl_new_BD_Shape_int32_t_from_BD_Shape, 106
ppl_new_BD_Shape_int32_t_from_BD_Shape, 105
ppl_new_BD_Shape_int32_t_from_BD_Shape, 106
ppl_new_BD_Shape_int32_t_from_BD_Shape, 106
ppl_new_BD_Shape_int32_t_from_BD_Shape, 108
ppl_new_BD_Shape_int32_t_from_BD_Shape, 105
ppl_new_BD_Shape_int32_t_from_BD_Shape, 107
ppl_new_BD_Shape_int32_t_from_BD_Shape, 105
ppl_new_BD_Shape_int32_t_from_BD_Shape, 106
ppl_new_BD_Shape_int32_t_from_C_Polyhedron, 105
ppl_new_BD_Shape_int32_t_from_C_Polyhedron, 107
ppl_new_BD_Shape_int32_t_from_congruences, 108
ppl_new_BD_Shape_int32_t_from_constraints, 108
ppl_new_BD_Shape_int32_t_from_Double_Box, 105
ppl_new_BD_Shape_int32_t_from_Double_Box_with_co 107
ppl_new_BD_Shape_int32_t_from_Float_Box, 105
ppl_new_BD_Shape_int32_t_from_Float_Box_with_comp 107
ppl_new_BD_Shape_int32_t_from_generators, 108
ppl_new_BD_Shape_int32_t_from_Grid, 105
ppl_new_BD_Shape_int32_t_from_Grid_with_complexit 107
ppl_new_BD_Shape_int32_t_from_Int16_Box, 104
ppl_new_BD_Shape_int32_t_from_Int16_Box_with_comp 106
ppl_new_BD_Shape_int32_t_from_Int32_Box, 104
ppl_new_BD_Shape_int32_t_from_Int32_Box_with_comp 106
ppl_new_BD_Shape_int32_t_from_Int64_Box, 104
ppl_new_BD_Shape_int32_t_from_Int64_Box_with_comp 106
ppl_new_BD_Shape_int32_t_from_Int8_Box, 104
ppl_new_BD_Shape_int32_t_from_Int8_Box_with_compl 106
ppl_new_BD_Shape_int32_t_from_Long_Double_Box, 105
ppl_new_BD_Shape_int32_t_from_Long_Double_Box_wit 107
ppl_new_BD_Shape_int32_t_from_NNC_Polyhedron, 105
ppl_new_BD_Shape_int32_t_from_NNC_Polyhedron_with 107
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_dou 105
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_dou 107
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_flo 105
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_flo 107
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int 105
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int 107

ppl_new_BD_Shape_int32_t_from_Octagonal_Shape, 105
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_with_complexity, 107
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int16_t, 105
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int16_t_with_complexity, 107
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int32_t, 105
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int32_t_with_complexity, 107
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int64_t, 106
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int64_t_with_complexity, 108
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int8_t, 105
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int8_t_with_complexity, 107
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_long_double, 105
ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_long_double_with_complexity, 107
ppl_new_BD_Shape_int32_t_from_Rational_Box, 105
ppl_new_BD_Shape_int32_t_from_Rational_Box_with_complexity, 106
ppl_new_BD_Shape_int32_t_from_space_dimension, 104
ppl_new_BD_Shape_int32_t_from_Uint16_t_Box, 105
ppl_new_BD_Shape_int32_t_from_Uint16_t_Box_with_complexity, 106
ppl_new_BD_Shape_int32_t_from_Uint32_t_Box, 105
ppl_new_BD_Shape_int32_t_from_Uint32_t_Box_with_complexity, 106
ppl_new_BD_Shape_int32_t_from_Uint64_t_Box, 105
ppl_new_BD_Shape_int32_t_from_Uint64_t_Box_with_complexity, 106
ppl_new_BD_Shape_int32_t_from_Uint8_t_Box, 104
ppl_new_BD_Shape_int32_t_from_Uint8_t_Box_with_complexity, 106
ppl_new_BD_Shape_int32_t_from_Z_Box, 105
ppl_new_BD_Shape_int32_t_from_Z_Box_with_complexity, 106
ppl_new_BD_Shape_int64_t_from_BD_Shape_double, 113
ppl_new_BD_Shape_int64_t_from_BD_Shape_double_with_complexity, 115
ppl_new_BD_Shape_int64_t_from_BD_Shape_int16_t, 113
ppl_new_BD_Shape_int64_t_from_BD_Shape_int16_t_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_BD_Shape_int32_t, 113
ppl_new_BD_Shape_int64_t_from_BD_Shape_int32_t_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_BD_Shape_int64_t, 113
ppl_new_BD_Shape_int64_t_from_BD_Shape_int64_t_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_BD_Shape_int8_t, 113
ppl_new_BD_Shape_int64_t_from_BD_Shape_int8_t_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_BD_Shape_long_double, 113
ppl_new_BD_Shape_int64_t_from_BD_Shape_long_double_with_complexity, 115
ppl_new_BD_Shape_int64_t_from_BD_Shape_mpq_class, 113
ppl_new_BD_Shape_int64_t_from_BD_Shape_mpq_class_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_BD_Shape_mpz_class, 113
ppl_new_BD_Shape_int64_t_from_BD_Shape_mpz_class_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_C_Polyhedron, 113
ppl_new_BD_Shape_int64_t_from_C_Polyhedron_with_complexity, 115
ppl_new_BD_Shape_int64_t_from_congruences, 116
ppl_new_BD_Shape_int64_t_from_constraints, 115
ppl_new_BD_Shape_int64_t_from_Double_Box, 113
ppl_new_BD_Shape_int64_t_from_Double_Box_with_complexity, 115
ppl_new_BD_Shape_int64_t_from_Float_Box, 113
ppl_new_BD_Shape_int64_t_from_Float_Box_with_complexity, 115
ppl_new_BD_Shape_int64_t_from_generators, 116
ppl_new_BD_Shape_int64_t_from_Grid, 113
ppl_new_BD_Shape_int64_t_from_Grid_with_complexity, 115

ppl_new_BD_Shape_int64_t_from_Int16_Box, 112
ppl_new_BD_Shape_int64_t_from_Int16_Box_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_Int32_Box, 112
ppl_new_BD_Shape_int64_t_from_Int32_Box_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_Int64_Box, 112
ppl_new_BD_Shape_int64_t_from_Int64_Box_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_Int8_Box, 112
ppl_new_BD_Shape_int64_t_from_Int8_Box_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_Long_Double_Box, 113
ppl_new_BD_Shape_int64_t_from_Long_Double_Box_with_complexity, 115
ppl_new_BD_Shape_int64_t_from_NNC_Polyhedron, 113
ppl_new_BD_Shape_int64_t_from_NNC_Polyhedron_with_complexity, 115
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape, 113
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_with_complexity, 115
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_float, 113
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_float_with_complexity, 115
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int16_t, 113
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int16_t_with_complexity, 115
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int32_t, 113
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int32_t_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int64_t, 113
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int64_t_with_complexity, 115
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int8_t, 113
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_mpq_class, 115
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_mpq_class_with_complexity, 113
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_mpz_class, 115
ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_mpz_class_with_complexity, 113
ppl_new_BD_Shape_int64_t_from_Rational_Box, 113
ppl_new_BD_Shape_int64_t_from_Rational_Box_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_space_dimension, 112
ppl_new_BD_Shape_int64_t_from_Uint16_Box, 112
ppl_new_BD_Shape_int64_t_from_Uint16_Box_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_Uint32_Box, 112
ppl_new_BD_Shape_int64_t_from_Uint32_Box_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_Uint64_Box, 112
ppl_new_BD_Shape_int64_t_from_Uint64_Box_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_Uint8_Box, 112
ppl_new_BD_Shape_int64_t_from_Uint8_Box_with_complexity, 114
ppl_new_BD_Shape_int64_t_from_Z_Box, 112
ppl_new_BD_Shape_int64_t_from_Z_Box_with_complexity, 114
ppl_new_BD_Shape_int8_t_from_BD_Shape_double, 90
ppl_new_BD_Shape_int8_t_from_BD_Shape_double_with_complexity, 92
ppl_new_BD_Shape_int8_t_from_BD_Shape_float, 90
ppl_new_BD_Shape_int8_t_from_BD_Shape_float_with_complexity, 91
ppl_new_BD_Shape_int8_t_from_BD_Shape_int16_t, 89
ppl_new_BD_Shape_int8_t_from_BD_Shape_int16_t_with_complexity, 91
ppl_new_BD_Shape_int8_t_from_BD_Shape_int32_t, 89
ppl_new_BD_Shape_int8_t_from_BD_Shape_int32_t_with_complexity, 91
ppl_new_BD_Shape_int8_t_from_BD_Shape_int64_t, 89
ppl_new_BD_Shape_int8_t_from_BD_Shape_int64_t_with_complexity, 91
ppl_new_BD_Shape_int8_t_from_BD_Shape_int8_t, 89

ppl_new_BD_Shape_int8_t_from_BD_Shape_int8_t_with_complexity, 90
ppl_new_BD_Shape_int8_t_from_BD_Shape_int8_t_with_complexity_and_dimension, 90
ppl_new_BD_Shape_int8_t_from_BD_Shape_int8_t_with_complexity_and_space_dimension, 92
ppl_new_BD_Shape_int8_t_from_C_Polyhedron, 89
ppl_new_BD_Shape_int8_t_from_C_Polyhedron_with_complexity, 91
ppl_new_BD_Shape_int8_t_from_congruences, 92
ppl_new_BD_Shape_int8_t_from_constraints, 92
ppl_new_BD_Shape_int8_t_from_Double_Box, 90
ppl_new_BD_Shape_int8_t_from_Double_Box_with_complexity, 92
ppl_new_BD_Shape_int8_t_from_Float_Box, 90
ppl_new_BD_Shape_int8_t_from_Float_Box_with_complexity, 91
ppl_new_BD_Shape_int8_t_from_generators, 92
ppl_new_BD_Shape_int8_t_from_Grid, 90
ppl_new_BD_Shape_int8_t_from_Grid_with_complexity, 91
ppl_new_BD_Shape_int8_t_from_Int16_Box, 89
ppl_new_BD_Shape_int8_t_from_Int16_Box_with_complexity, 90
ppl_new_BD_Shape_int8_t_from_Int32_Box, 89
ppl_new_BD_Shape_int8_t_from_Int32_Box_with_complexity, 90
ppl_new_BD_Shape_int8_t_from_Int64_Box, 89
ppl_new_BD_Shape_int8_t_from_Int64_Box_with_complexity, 90
ppl_new_BD_Shape_int8_t_from_Int8_Box, 89
ppl_new_BD_Shape_int8_t_from_Int8_Box_with_complexity, 90
ppl_new_BD_Shape_int8_t_from_Long_Double_Box_with_complexity, 92
ppl_new_BD_Shape_int8_t_from_NNC_Polyhedron, 89
ppl_new_BD_Shape_int8_t_from_NNC_Polyhedron_with_complexity, 91
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_double, 90
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_double_and_complexity, 92
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_float, 90
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_float_and_complexity, 91
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int16, 89
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int16_and_complexity, 91
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int32, 89
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int32_and_complexity, 91
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int64, 89
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int64_and_complexity, 91
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int8, 89
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int8_and_complexity, 91
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_long_double, 90
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_long_double_and_complexity, 92
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_mpq_class, 89
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_mpq_class_and_complexity, 91
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_mpz_class, 89
ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_mpz_class_and_complexity, 91
ppl_new_BD_Shape_int8_t_from_Rational_Box, 89
ppl_new_BD_Shape_int8_t_from_Rational_Box_with_complexity, 90
ppl_new_BD_Shape_int8_t_from_space_dimension, 89
ppl_new_BD_Shape_int8_t_from_Uint16_Box, 89
ppl_new_BD_Shape_int8_t_from_Uint16_Box_with_complexity, 90
ppl_new_BD_Shape_int8_t_from_Uint32_Box, 89

ppl_new_BD_Shape_int8_t_from_Uint32_Box_with_complexity, 90
ppl_new_BD_Shape_int8_t_from_Uint64_Box, 89
ppl_new_BD_Shape_int8_t_from_Uint64_Box_with_complexity, 90
ppl_new_BD_Shape_int8_t_from_Uint8_Box, 89
ppl_new_BD_Shape_int8_t_from_Uint8_Box_with_complexity, 90
ppl_new_BD_Shape_int8_t_from_Z_Box, 89
ppl_new_BD_Shape_int8_t_from_Z_Box_with_complexity, 90
ppl_new_BD_Shape_long_double_from_BD_Shape_long_double, 435
ppl_new_BD_Shape_long_double_from_BD_Shape_long_double_with_complexity, 437
ppl_new_BD_Shape_long_double_from_BD_Shape_mpq_class, 434
ppl_new_BD_Shape_long_double_from_BD_Shape_mpq_class_with_complexity, 436
ppl_new_BD_Shape_long_double_from_BD_Shape_mpz_class, 434
ppl_new_BD_Shape_long_double_from_BD_Shape_mpz_class_with_complexity, 436
ppl_new_BD_Shape_long_double_from_C_Polyhedron, 435
ppl_new_BD_Shape_long_double_from_C_Polyhedron_with_complexity, 436
ppl_new_BD_Shape_long_double_from_congruences, 437
ppl_new_BD_Shape_long_double_from_constraints, 437
ppl_new_BD_Shape_long_double_from_Double_Box, 435
ppl_new_BD_Shape_long_double_from_Double_Box_with_complexity, 437
ppl_new_BD_Shape_long_double_from_Float_Box, 435
ppl_new_BD_Shape_long_double_from_Float_Box_with_complexity, 437
ppl_new_BD_Shape_long_double_from_generators, 437
ppl_new_BD_Shape_long_double_from_Grid, 435
ppl_new_BD_Shape_long_double_from_Grid_with_complexity, 437
ppl_new_BD_Shape_long_double_from_Int16_Box, 434
ppl_new_BD_Shape_long_double_from_Int16_Box_with_complexity, 435
ppl_new_BD_Shape_long_double_from_Int32_Box, 434
ppl_new_BD_Shape_long_double_from_Int32_Box_with_complexity, 435
ppl_new_BD_Shape_long_double_from_Int64_Box, 434
ppl_new_BD_Shape_long_double_from_Int64_Box_with_complexity, 435
ppl_new_BD_Shape_long_double_from_Int8_Box, 434
ppl_new_BD_Shape_long_double_from_Int8_Box_with_complexity, 435
ppl_new_BD_Shape_long_double_from_Long_Double_Box, 435
ppl_new_BD_Shape_long_double_from_Long_Double_Box_with_complexity, 437
ppl_new_BD_Shape_long_double_from_NNC_Polyhedron, 435
ppl_new_BD_Shape_long_double_from_NNC_Polyhedron_with_complexity, 436
ppl_new_BD_Shape_long_double_from_Octagonal_Shape, 435
ppl_new_BD_Shape_long_double_from_Octagonal_Shape_with_complexity, 437
ppl_new_BD_Shape_long_double_from_Octagonal_Shape, 435
ppl_new_BD_Shape_long_double_from_Octagonal_Shape_with_complexity, 437
ppl_new_BD_Shape_long_double_from_Polyhedron, 434
ppl_new_BD_Shape_long_double_from_Polyhedron_with_complexity, 436

ppl_new_BD_Shape_long_double_from_Oct... 434
ppl_new_BD_Shape_long_double_from_Oct... 436
ppl_new_BD_Shape_long_double_from_Oct... 434
ppl_new_BD_Shape_long_double_from_Oct... 436
ppl_new_BD_Shape_long_double_from_Oct... 434
ppl_new_BD_Shape_long_double_from_Oct... 436
ppl_new_BD_Shape_long_double_from_Oct... 435
ppl_new_BD_Shape_long_double_from_Oct... 437
ppl_new_BD_Shape_long_double_from_Oct... 435
ppl_new_BD_Shape_long_double_from_Oct... 436
ppl_new_BD_Shape_long_double_from_Oct... 435
ppl_new_BD_Shape_long_double_from_Oct... 436
ppl_new_BD_Shape_long_double_from_Rat... 434
ppl_new_BD_Shape_long_double_from_Rat... 436
ppl_new_BD_Shape_long_double_from_spa... 434
ppl_new_BD_Shape_long_double_from_Uin... 434
ppl_new_BD_Shape_long_double_from_Uin... 435
ppl_new_BD_Shape_long_double_from_Uin... 434
ppl_new_BD_Shape_long_double_from_Uin... 435
ppl_new_BD_Shape_long_double_from_Uin... 434
ppl_new_BD_Shape_long_double_from_Uin... 436
ppl_new_BD_Shape_long_double_from_Uin... 434
ppl_new_BD_Shape_long_double_from_Uin... 435
ppl_new_BD_Shape_long_double_from_Z_B... 434
ppl_new_BD_Shape_long_double_from_Z_B... 436
ppl_new_BD_Shape_mpq_class_from_BD_S... 130
ppl_new_BD_Shape_mpq_class_from_BD_S... 131
ppl_new_BD_Shape_mpq_class_from_BD_Shape_float, 129
ppl_new_BD_Shape_mpq_class_from_BD_Shape_float_wi... 131
ppl_new_BD_Shape_mpq_class_from_BD_Shape_int16_t, 129
ppl_new_BD_Shape_mpq_class_from_BD_Shape_int16_t... 130
ppl_new_BD_Shape_mpq_class_from_BD_Shape_int32_t, 129
ppl_new_BD_Shape_mpq_class_from_BD_Shape_int32_t... 130
ppl_new_BD_Shape_mpq_class_from_BD_Shape_int64_t, 129
ppl_new_BD_Shape_mpq_class_from_BD_Shape_int64_t... 130
ppl_new_BD_Shape_mpq_class_from_BD_Shape_int8_t, 129
ppl_new_BD_Shape_mpq_class_from_BD_Shape_int8_t_w... 130
ppl_new_BD_Shape_mpq_class_from_BD_Shape_long_dou... 130
ppl_new_BD_Shape_mpq_class_from_BD_Shape_long_dou... 132
ppl_new_BD_Shape_mpq_class_from_BD_Shape_mpq_clas... 129
ppl_new_BD_Shape_mpq_class_from_BD_Shape_mpq_clas... 131
ppl_new_BD_Shape_mpq_class_from_BD_Shape_mpz_clas... 129
ppl_new_BD_Shape_mpq_class_from_BD_Shape_mpz_clas... 131
ppl_new_BD_Shape_mpq_class_from_C_Polyhedron, 129
ppl_new_BD_Shape_mpq_class_from_C_Polyhedron_with... 131
ppl_new_BD_Shape_mpq_class_from_congruences, 132
ppl_new_BD_Shape_mpq_class_from_constraints, 132
ppl_new_BD_Shape_mpq_class_from_Double_Box, 129
ppl_new_BD_Shape_mpq_class_from_Double_Box_with_... 131
ppl_new_BD_Shape_mpq_class_from_Float_Box, 129
ppl_new_BD_Shape_mpq_class_from_Float_Box_with_co... 131
ppl_new_BD_Shape_mpq_class_from_generators, 132
ppl_new_BD_Shape_mpq_class_from_Grid, 129
ppl_new_BD_Shape_mpq_class_from_Grid_with_complex... 131

ppl_new_BD_Shape_mpq_class_from_Int16_Box, 128
ppl_new_BD_Shape_mpq_class_from_Int16_Box_with_complexity, 130
ppl_new_BD_Shape_mpq_class_from_Int32_Box, 128
ppl_new_BD_Shape_mpq_class_from_Int32_Box_with_complexity, 130
ppl_new_BD_Shape_mpq_class_from_Int64_Box, 128
ppl_new_BD_Shape_mpq_class_from_Int64_Box_with_complexity, 130
ppl_new_BD_Shape_mpq_class_from_Int8_Box, 128
ppl_new_BD_Shape_mpq_class_from_Int8_Box_with_complexity, 130
ppl_new_BD_Shape_mpq_class_from_Long_Double_Box, 130
ppl_new_BD_Shape_mpq_class_from_Long_Double_Box_with_complexity, 132
ppl_new_BD_Shape_mpq_class_from_NNC_Polyhedron, 129
ppl_new_BD_Shape_mpq_class_from_NNC_Polyhedron_with_complexity, 131
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_double, 130
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_double_with_complexity, 131
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_float, 129
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_float_with_complexity, 131
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int16_t, 129
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int16_t_with_complexity, 131
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int32_t, 129
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int32_t_with_complexity, 131
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int64_t, 130
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int64_t_with_complexity, 132
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int8_t, 129
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_mpq_class, 131
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_mpq_class_with_complexity, 129
ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_mpz_class, 131
ppl_new_BD_Shape_mpq_class_from_Rational_Box, 130
ppl_new_BD_Shape_mpq_class_from_Rational_Box_with_complexity, 129
ppl_new_BD_Shape_mpq_class_from_space_dimension, 128
ppl_new_BD_Shape_mpq_class_from_Uint16_Box, 129
ppl_new_BD_Shape_mpq_class_from_Uint16_Box_with_complexity, 130
ppl_new_BD_Shape_mpq_class_from_Uint32_Box, 129
ppl_new_BD_Shape_mpq_class_from_Uint32_Box_with_complexity, 130
ppl_new_BD_Shape_mpq_class_from_Uint64_Box, 129
ppl_new_BD_Shape_mpq_class_from_Uint64_Box_with_complexity, 130
ppl_new_BD_Shape_mpq_class_from_Uint8_Box, 129
ppl_new_BD_Shape_mpq_class_from_Uint8_Box_with_complexity, 130
ppl_new_BD_Shape_mpq_class_from_Z_Box, 129
ppl_new_BD_Shape_mpq_class_from_Z_Box_with_complexity, 130
ppl_new_BD_Shape_mpz_class_from_BD_Shape_double, 121
ppl_new_BD_Shape_mpz_class_from_BD_Shape_double_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_BD_Shape_float, 121
ppl_new_BD_Shape_mpz_class_from_BD_Shape_float_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_BD_Shape_int16_t, 121
ppl_new_BD_Shape_mpz_class_from_BD_Shape_int16_t_with_complexity, 122
ppl_new_BD_Shape_mpz_class_from_BD_Shape_int32_t, 121
ppl_new_BD_Shape_mpz_class_from_BD_Shape_int32_t_with_complexity, 122
ppl_new_BD_Shape_mpz_class_from_BD_Shape_int64_t, 121
ppl_new_BD_Shape_mpz_class_from_BD_Shape_int64_t_with_complexity, 122
ppl_new_BD_Shape_mpz_class_from_BD_Shape_int8_t, 121

ppl_new_BD_Shape_mpz_class_from_BD_Shape_with_complexity, 122
ppl_new_BD_Shape_mpz_class_from_BD_Shape, 121
ppl_new_BD_Shape_mpz_class_from_BD_Shape_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_C_Polyhedron, 121
ppl_new_BD_Shape_mpz_class_from_C_Polyhedron_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_congruences, 124
ppl_new_BD_Shape_mpz_class_from_constraints, 124
ppl_new_BD_Shape_mpz_class_from_DoublePrecision_Box, 121
ppl_new_BD_Shape_mpz_class_from_DoublePrecision_Box_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_Float_Box, 121
ppl_new_BD_Shape_mpz_class_from_Float_Box_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_generators, 124
ppl_new_BD_Shape_mpz_class_from_Grid, 121
ppl_new_BD_Shape_mpz_class_from_Grid_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_Int16_Box, 120
ppl_new_BD_Shape_mpz_class_from_Int16_Box_with_complexity, 122
ppl_new_BD_Shape_mpz_class_from_Int32_Box, 120
ppl_new_BD_Shape_mpz_class_from_Int32_Box_with_complexity, 122
ppl_new_BD_Shape_mpz_class_from_Int64_Box, 120
ppl_new_BD_Shape_mpz_class_from_Int64_Box_with_complexity, 122
ppl_new_BD_Shape_mpz_class_from_Int8_Box, 120
ppl_new_BD_Shape_mpz_class_from_Int8_Box_with_complexity, 122
ppl_new_BD_Shape_mpz_class_from_Long_Double_Box, 121
ppl_new_BD_Shape_mpz_class_from_Long_Double_Box_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_Long_Long_Box, 121
ppl_new_BD_Shape_mpz_class_from_Long_Long_Box_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_NNC_Polyhedron, 121
ppl_new_BD_Shape_mpz_class_from_NNC_Polyhedron_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape, 121
ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_mpq_class, 121
ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_mpq_class_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_mpz_class, 121
ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_mpz_class_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_ntype, 121
ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_ntype_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_Rational_Box, 121
ppl_new_BD_Shape_mpz_class_from_Rational_Box_with_complexity, 123
ppl_new_BD_Shape_mpz_class_from_space_dimension, 120
ppl_new_BD_Shape_mpz_class_from_Uint16_Box, 120
ppl_new_BD_Shape_mpz_class_from_Uint16_Box_with_complexity, 122
ppl_new_BD_Shape_mpz_class_from_Uint32_Box, 120

ppl_new_BD_Shape_mpz_class_from_Uint32_Box_with_complexity, 122
ppl_new_BD_Shape_mpz_class_from_Uint64_Box, 120
ppl_new_BD_Shape_mpz_class_from_Uint64_Box_with_complexity, 122
ppl_new_BD_Shape_mpz_class_from_Uint8_Box, 120
ppl_new_BD_Shape_mpz_class_from_Uint8_Box_with_complexity, 122
ppl_new_BD_Shape_mpz_class_from_Z_Box, 121
ppl_new_BD_Shape_mpz_class_from_Z_Box_with_complexity, 122
ppl_new_C_Polyhedron_from_BD_Shape_double, 190
ppl_new_C_Polyhedron_from_BD_Shape_double_with_complexity, 193
ppl_new_C_Polyhedron_from_BD_Shape_float, 190
ppl_new_C_Polyhedron_from_BD_Shape_float_with_complexity, 193
ppl_new_C_Polyhedron_from_BD_Shape_int16_t, 189
ppl_new_C_Polyhedron_from_BD_Shape_int16_t_with_complexity, 191
ppl_new_C_Polyhedron_from_BD_Shape_int32_t, 189
ppl_new_C_Polyhedron_from_BD_Shape_int32_t_with_complexity, 192
ppl_new_C_Polyhedron_from_BD_Shape_int64_t, 189
ppl_new_C_Polyhedron_from_BD_Shape_int64_t_with_complexity, 192
ppl_new_C_Polyhedron_from_BD_Shape_int8_t, 189
ppl_new_C_Polyhedron_from_BD_Shape_int8_t_with_complexity, 191
ppl_new_C_Polyhedron_from_BD_Shape_long_double, 190
ppl_new_C_Polyhedron_from_BD_Shape_long_double_with_complexity, 194
ppl_new_C_Polyhedron_from_BD_Shape_mpq_class, 189
ppl_new_C_Polyhedron_from_BD_Shape_mpq_class_with_complexity, 192
ppl_new_C_Polyhedron_from_BD_Shape_mpz_class, 189
ppl_new_C_Polyhedron_from_BD_Shape_mpz_class_with_complexity, 192
ppl_new_C_Polyhedron_from_C_Polyhedron, 190
ppl_new_C_Polyhedron_from_C_Polyhedron_with_complexity, 193
ppl_new_C_Polyhedron_from_congruences, 194
ppl_new_C_Polyhedron_from_constraints, 194
ppl_new_C_Polyhedron_from_Double_Box, 190
ppl_new_C_Polyhedron_from_Double_Box_with_complexity, 193
ppl_new_C_Polyhedron_from_Float_Box, 190
ppl_new_C_Polyhedron_from_Float_Box_with_complexity, 193
ppl_new_C_Polyhedron_from_generators, 194
ppl_new_C_Polyhedron_from_Grid, 190
ppl_new_C_Polyhedron_from_Grid_with_complexity, 193
ppl_new_C_Polyhedron_from_Int16_Box, 188
ppl_new_C_Polyhedron_from_Int16_Box_with_complexity, 191
ppl_new_C_Polyhedron_from_Int32_Box, 188
ppl_new_C_Polyhedron_from_Int32_Box_with_complexity, 191
ppl_new_C_Polyhedron_from_Int64_Box, 188
ppl_new_C_Polyhedron_from_Int64_Box_with_complexity, 191
ppl_new_C_Polyhedron_from_Int8_Box, 188
ppl_new_C_Polyhedron_from_Int8_Box_with_complexity, 190
ppl_new_C_Polyhedron_from_Long_Double_Box, 190
ppl_new_C_Polyhedron_from_Long_Double_Box_with_complexity, 194
ppl_new_C_Polyhedron_from_NNC_Polyhedron, 190
ppl_new_C_Polyhedron_from_NNC_Polyhedron_with_complexity, 193
ppl_new_C_Polyhedron_from_Octagonal_Shape_double, 190
ppl_new_C_Polyhedron_from_Octagonal_Shape_double_with_complexity, 194
ppl_new_C_Polyhedron_from_Octagonal_Shape_float, 190
ppl_new_C_Polyhedron_from_Octagonal_Shape_float_with_complexity, 193
ppl_new_C_Polyhedron_from_Octagonal_Shape_int16_t, 189
ppl_new_C_Polyhedron_from_Octagonal_Shape_int16_t_with_complexity, 192
ppl_new_C_Polyhedron_from_Octagonal_Shape_int32_t

189
ppl_new_C_Polyhedron_from_Octagonal_Shape_int32_t_with_complexity,
192
ppl_new_C_Polyhedron_from_Octagonal_Shape_int64_t,
189
ppl_new_C_Polyhedron_from_Octagonal_Shape_int64_t_with_complexity,
192
ppl_new_C_Polyhedron_from_Octagonal_Shape_int8_t,
189
ppl_new_C_Polyhedron_from_Octagonal_Shape_int8_t_with_complexity,
192
ppl_new_C_Polyhedron_from_Octagonal_Shape_long_double,
190
ppl_new_C_Polyhedron_from_Octagonal_Shape_long_double_with_complexity,
194
ppl_new_C_Polyhedron_from_Octagonal_Shape_mpq_class,
190
ppl_new_C_Polyhedron_from_Octagonal_Shape_mpq_class_with_complexity,
193
ppl_new_C_Polyhedron_from_Octagonal_Shape_mpz_class,
190
ppl_new_C_Polyhedron_from_Octagonal_Shape_mpz_class_with_complexity,
192
ppl_new_C_Polyhedron_from_Rational_Box,
189
ppl_new_C_Polyhedron_from_Rational_Box_with_complexity,
191
ppl_new_C_Polyhedron_from_space_dimension,
188
ppl_new_C_Polyhedron_from_Uint16_Box,
188
ppl_new_C_Polyhedron_from_Uint16_Box_with_complexity,
191
ppl_new_C_Polyhedron_from_Uint32_Box,
189
ppl_new_C_Polyhedron_from_Uint32_Box_with_complexity,
191
ppl_new_C_Polyhedron_from_Uint64_Box,
189
ppl_new_C_Polyhedron_from_Uint64_Box_with_complexity,
191
ppl_new_C_Polyhedron_from_Uint8_Box,
188
ppl_new_C_Polyhedron_from_Uint8_Box_with_complexity,
191
ppl_new_C_Polyhedron_from_Z_Box, 189
ppl_new_C_Polyhedron_from_Z_Box_with_complexity,
191
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_double,
323
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_double_with_complexity,
326
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_float,
323
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_int32_t,
325
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_int32_t_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_int64_t,
324
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_int64_t_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_int8_t,
325
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_int8_t_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_long_double,
325
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_long_double_with_complexity,
322
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_mpq_class,
324
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_mpq_class_with_complexity,
324
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_mpz_class,
326
ppl_new_Constraints_Product_C_Polyhedron_from_BD_Shape_mpz_class_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Box,
325
ppl_new_Constraints_Product_C_Polyhedron_from_Box_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Constraint_System,
325
ppl_new_Constraints_Product_C_Polyhedron_from_Constraint_System_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Generator_System,
325
ppl_new_Constraints_Product_C_Polyhedron_from_Generator_System_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Grid,
325
ppl_new_Constraints_Product_C_Polyhedron_from_Grid_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_double,
325
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_double_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_float,
325
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_int32_t,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_int32_t_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_int64_t,
325
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_int64_t_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_int8_t,
325
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_int8_t_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_long_double,
325
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_long_double_with_complexity,
322
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_mpq_class,
324
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_mpq_class_with_complexity,
324
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_mpz_class,
326
ppl_new_Constraints_Product_C_Polyhedron_from_Octagonal_Shape_mpz_class_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Rational_Box,
325
ppl_new_Constraints_Product_C_Polyhedron_from_Rational_Box_with_complexity,
323
ppl_new_Constraints_Product_C_Polyhedron_from_space_dimension,
325
ppl_new_Constraints_Product_C_Polyhedron_from_Uint16_Box,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Uint16_Box_with_complexity,
325
ppl_new_Constraints_Product_C_Polyhedron_from_Uint32_Box,
326
ppl_new_Constraints_Product_C_Polyhedron_from_Uint32_Box_with_complexity,
326
ppl_new_Constraints_Product_C_Polyhedron_from_Uint64_Box,
324
ppl_new_Constraints_Product_C_Polyhedron_from_Uint64_Box_with_complexity,
326
ppl_new_Constraints_Product_C_Polyhedron_from_Uint8_Box,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Uint8_Box_with_complexity,
325
ppl_new_Constraints_Product_C_Polyhedron_from_Z_Box,
323
ppl_new_Constraints_Product_C_Polyhedron_from_Z_Box_with_complexity,
325

ppl_new_Constraints_Product_C_Polyhe… 322
ppl_new_Constraints_Product_C_Polyhe… 324
ppl_new_Constraints_Product_C_Polyhe… 322
ppl_new_Constraints_Product_C_Polyhe… 324
ppl_new_Constraints_Product_C_Polyhe… 322
ppl_new_Constraints_Product_C_Polyhe… 324
ppl_new_Constraints_Product_C_Polyhe… 322
ppl_new_Constraints_Product_C_Polyhe… 324
ppl_new_Constraints_Product_C_Polyhe… 324
ppl_new_Constraints_Product_C_Polyhe… 326
ppl_new_Constraints_Product_C_Polyhe… 323
ppl_new_Constraints_Product_C_Polyhe… 325
ppl_new_Constraints_Product_C_Polyhe… 324
ppl_new_Constraints_Product_C_Polyhe… 326
ppl_new_Constraints_Product_C_Polyhe… 323
ppl_new_Constraints_Product_C_Polyhe… 325
ppl_new_Constraints_Product_C_Polyhe… 323
ppl_new_Constraints_Product_C_Polyhe… 325
ppl_new_Constraints_Product_C_Polyhe… 323
ppl_new_Constraints_Product_C_Polyhe… 325
ppl_new_Constraints_Product_C_Polyhe… 323
ppl_new_Constraints_Product_C_Polyhe… 325
ppl_new_Constraints_Product_C_Polyhe… 323
ppl_new_Constraints_Product_C_Polyhe… 325
ppl_new_Constraints_Product_C_Polyhe… 324
ppl_new_Constraints_Product_C_Polyhe… 326
ppl_new_Constraints_Product_C_Polyhe… 323

ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int16_Box, 325
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int16_Box_with_complexity, 323
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int32_Box, 325
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int32_Box_with_complexity, 322
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int64_Box, 324
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int64_Box_with_complexity, 322
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int8_Box, 322
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int8_Box_with_complexity, 324
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Long_Double_Box, 322
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Long_Double_Box_with_complexity, 324
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_NNC_Polyhedron, 322
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_NNC_Polyhedron_with_complexity, 324
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_double, 322
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_double_with_complexity, 324
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_float, 322
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_float_with_complexity, 324
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int16_t, 339
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int16_t_with_complexity, 341
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int32_t, 339
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int32_t_with_complexity, 341
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int64_t, 338
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int64_t_with_complexity, 340
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int8_t, 338
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int8_t_with_complexity, 340
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_long_double, 338
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_long_double_with_complexity, 340
ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_mpq_class, 338

ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int8_t, 339
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int8_t_with_Complexity, 340
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_mpq_class, 339
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_mpq_class_with_Complexity, 341
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_mpz_class, 338
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_mpz_class_with_Complexity, 339
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_C_Polyhedron, 340
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_C_Polyhedron_with_Complexity, 339
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Constraints_Product, 341
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Constraints_Product_with_Complexity, 339
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Constraint_System, 342
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Constraint_System_with_Complexity, 340
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grid_Generator_System, 342
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grid_Generator_System_with_Complexity, 339
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grids_Difference, 339
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grids_Difference_with_Complexity, 341
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grids_Intersection, 341
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grids_Intersection_with_Complexity, 338
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grids_Product, 339
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grids_Product_with_Complexity, 341
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grid_Simplex_Expansion, 339
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grid_Simplex_Expansion_with_Complexity, 341
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grid_Universe, 339
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grid_Universe_with_Complexity, 338
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_int16_Box, 340
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_int16_Box_with_Complexity, 339
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_int32_Box, 338
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_int32_Box_with_Complexity, 340
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_int64_Box, 338
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_int64_Box_with_Complexity, 340
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_int8_Box, 338
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_int8_Box_with_Complexity, 339

ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uints32_Box, 338
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uints32_Box_with_Complexity, 340
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uints64_Box, 338
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uints64_Box_with_Complexity, 340
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uints8_Box, 338
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uints8_Box_with_Complexity, 340
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_ZInt_Box, 338
ppl_new_Constraints_Product_Grid_C_Polyhedron_from_ZInt_Box_with_Complexity, 340
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_double, 347
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_double_with_Complexity, 349
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_float, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_float_with_Complexity, 349
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int16, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int16_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int32, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int32_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int64, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int64_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int8, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int8_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Box, 347
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Box_with_Complexity, 350
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_C_Polyhedron, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Congruences, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Generators, 347
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Generators_with_Complexity, 349
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_NNC_Polyhedron, 349
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_double, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_double_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_float, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_float_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int16, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int16_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int32, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int32_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int64, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int64_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int8, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int8_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Polyhedron, 346

ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid, 331
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid_with_Complexity, 334
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid, 331
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid_with_Complexity, 333
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid, 330
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_with_Complexity, 349
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid_with_Complexity, 332
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid, 330
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid_with_Complexity, 332
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product, 347
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid, 330
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_with_Complexity, 350
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid_with_Complexity, 332
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid, 330
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_with_Complexity, 349
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid_with_Complexity, 332
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid, 331
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_with_Complexity, 349
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_NNC_Polyhedron_Grid_with_Complexity, 334
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Rational_Box, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Rational_Box_NNC_Polyhedron_Grid, 330
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Rational_Box_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Rational_Box_NNC_Polyhedron_Grid_with_Complexity, 333
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_space_dimension, 345
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_space_dimension_NNC_Polyhedron_Grid, 330
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint16_Box, 345
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint16_Box_NNC_Polyhedron_Grid, 332
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint16_Box_with_Complexity, 347
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint16_Box_NNC_Polyhedron_Grid_with_Complexity, 331
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint32_Box, 345
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint32_Box_NNC_Polyhedron_Grid, 333
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint32_Box_with_Complexity, 347
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint32_Box_NNC_Polyhedron_Grid_with_Complexity, 334
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint64_Box, 345
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint64_Box_NNC_Polyhedron_Grid, 334
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint64_Box_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint64_Box_NNC_Polyhedron_Grid_with_Complexity, 331
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint8_Box, 345
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint8_Box_NNC_Polyhedron_Grid, 334
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint8_Box_with_Complexity, 347
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint8_Box_NNC_Polyhedron_Grid_with_Complexity, 331
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_ISBox, 346
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_ISBox_NNC_Polyhedron_Grid, 334
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_ISBox_with_Complexity, 348
ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_ISBox_NNC_Polyhedron_Grid_with_Complexity, 331

ppl_new_Constraints_Product_NNC_Polyhedron_from_Constraint_System, 333
ppl_new_Constraints_Product_NNC_Polyhedron_from_Grid, 331
ppl_new_Constraints_Product_NNC_Polyhedron_from_Grid_with_complexity, 333
ppl_new_Constraints_Product_NNC_Polyhedron_from_Box, 330
ppl_new_Constraints_Product_NNC_Polyhedron_from_Box_with_complexity, 331
ppl_new_Constraints_Product_NNC_Polyhedron_from_C_Polyhedron, 330
ppl_new_Constraints_Product_NNC_Polyhedron_from_C_Polyhedron_with_complexity, 332
ppl_new_Constraints_Product_NNC_Polyhedron_from_NNC_Polyhedron, 330
ppl_new_Constraints_Product_NNC_Polyhedron_from_NNC_Polyhedron_with_complexity, 330
ppl_new_Constraints_Product_NNC_Polyhedron_from_Generator_System, 331
ppl_new_Constraints_Product_NNC_Polyhedron_from_Generator_System_with_complexity, 334
ppl_new_Constraints_Product_NNC_Polyhedron_from_Polyhedron, 331
ppl_new_Constraints_Product_NNC_Polyhedron_from_Polyhedron_with_complexity, 333
ppl_new_Constraints_Product_NNC_Polyhedron_from_BD_Shape_double, 330
ppl_new_Constraints_Product_NNC_Polyhedron_from_BD_Shape_double_with_complexity, 333
ppl_new_Constraints_Product_NNC_Polyhedron_from_BD_Shape_float, 330
ppl_new_Constraints_Product_NNC_Polyhedron_from_BD_Shape_float_with_complexity, 333
ppl_new_Constraints_Product_NNC_Polyhedron_from_BD_Shape_int16_t, 331
ppl_new_Constraints_Product_NNC_Polyhedron_from_BD_Shape_int16_t_with_complexity, 333
ppl_new_Constraints_Product_NNC_Polyhedron_from_BD_Shape_int32_t, 330
ppl_new_Constraints_Product_NNC_Polyhedron_from_BD_Shape_int32_t_with_complexity, 333
ppl_new_Constraints_Product_NNC_Polyhedron_from_BD_Shape_int64_t, 331
ppl_new_Constraints_Product_NNC_Polyhedron_from_BD_Shape_int64_t_with_complexity, 333
ppl_new_Constraints_Product_NNC_Polyhedron_from_BD_Shape_int8_t, 330
ppl_new_Constraints_Product_NNC_Polyhedron_from_BD_Shape_int8_t_with_complexity, 333

ppl_new_Double_Box_from_BD_Shape_int64_t, 390
ppl_new_Double_Box_from_BD_Shape_int64_t_with_complexity, 391
ppl_new_Double_Box_from_BD_Shape_int8_t, 390
ppl_new_Double_Box_from_BD_Shape_int8_t_with_complexity, 391
ppl_new_Double_Box_from_BD_Shape_long_double, 390
ppl_new_Double_Box_from_BD_Shape_long_double_with_complexity, 392
ppl_new_Double_Box_from_BD_Shape_mpq_class, 390
ppl_new_Double_Box_from_BD_Shape_mpq_class_with_complexity, 391
ppl_new_Double_Box_from_BD_Shape_mpz_class, 390
ppl_new_Double_Box_from_BD_Shape_mpz_class_with_complexity, 391
ppl_new_Double_Box_from_C_Polyhedron, 390
ppl_new_Double_Box_from_C_Polyhedron_with_complexity, 392
ppl_new_Double_Box_from_congruences, 392
ppl_new_Double_Box_from_constraints, 392
ppl_new_Double_Box_from_Double_Box, 390
ppl_new_Double_Box_from_Double_Box_with_complexity, 392
ppl_new_Double_Box_from_Float_Box, 390
ppl_new_Double_Box_from_Float_Box_with_complexity, 392
ppl_new_Double_Box_from_generators, 392
ppl_new_Double_Box_from_Grid, 390
ppl_new_Double_Box_from_Grid_with_complexity, 392
ppl_new_Double_Box_from_Int16_Box, 390
ppl_new_Double_Box_from_Int16_Box_with_complexity, 391
ppl_new_Double_Box_from_Int32_Box, 390
ppl_new_Double_Box_from_Int32_Box_with_complexity, 391
ppl_new_Double_Box_from_Int64_Box, 390
ppl_new_Double_Box_from_Int64_Box_with_complexity, 391
ppl_new_Double_Box_from_Int8_Box, 390
ppl_new_Double_Box_from_Int8_Box_with_complexity, 391
ppl_new_Double_Box_from_Long_Double_Box, 390
ppl_new_Double_Box_from_Long_Double_Box_with_complexity, 392
ppl_new_Double_Box_from_NNC_Polyhedron, 390
ppl_new_Double_Box_from_NNC_Polyhedron_with_complexity, 392
ppl_new_Double_Box_from_Octagonal_Shape_double, 390
ppl_new_Double_Box_from_Octagonal_Shape_double_with_complexity, 392
ppl_new_Double_Box_from_Octagonal_Shape_float, 390
ppl_new_Double_Box_from_Octagonal_Shape_float_with_complexity, 392
ppl_new_Double_Box_from_Octagonal_Shape_int16_t, 390
ppl_new_Double_Box_from_Octagonal_Shape_int16_t_with_complexity, 391
ppl_new_Double_Box_from_Octagonal_Shape_int32_t, 390
ppl_new_Double_Box_from_Octagonal_Shape_int32_t_with_complexity, 391
ppl_new_Double_Box_from_Octagonal_Shape_int64_t, 390
ppl_new_Double_Box_from_Octagonal_Shape_int64_t_with_complexity, 392
ppl_new_Double_Box_from_Octagonal_Shape_int8_t, 390
ppl_new_Double_Box_from_Octagonal_Shape_int8_t_with_complexity, 391
ppl_new_Double_Box_from_Octagonal_Shape_long_double, 391
ppl_new_Double_Box_from_Octagonal_Shape_long_double_with_complexity, 392
ppl_new_Double_Box_from_Octagonal_Shape_mpq_class, 390
ppl_new_Double_Box_from_Octagonal_Shape_mpq_class_with_complexity, 392
ppl_new_Double_Box_from_Octagonal_Shape_mpz_class, 390
ppl_new_Double_Box_from_Octagonal_Shape_mpz_class_with_complexity, 392
ppl_new_Double_Box_from_Rational_Box, 390
ppl_new_Double_Box_from_Rational_Box_with_complexity, 391
ppl_new_Double_Box_from_space_dimension, 390
ppl_new_Double_Box_from_Uint16_Box,

390
ppl_new_Double_Box_from_Uint16_Box_with_complexity,
391
ppl_new_Double_Box_from_Uint32_Box,
390
ppl_new_Double_Box_from_Uint32_Box_with_complexity,
391
ppl_new_Double_Box_from_Uint64_Box,
390
ppl_new_Double_Box_from_Uint64_Box_with_complexity,
391
ppl_new_Double_Box_from_Uint8_Box,
390
ppl_new_Double_Box_from_Uint8_Box_with_complexity,
391
ppl_new_Double_Box_from_Z_Box, 390
ppl_new_Double_Box_from_Z_Box_with_complexity,
391
ppl_new_Float_Box_from_BD_Shape_double,
354
ppl_new_Float_Box_from_BD_Shape_double_with_complexity,
356
ppl_new_Float_Box_from_BD_Shape_float,
354
ppl_new_Float_Box_from_BD_Shape_float_with_complexity,
356
ppl_new_Float_Box_from_BD_Shape_int16_t,
354
ppl_new_Float_Box_from_BD_Shape_int16_t_with_complexity,
355
ppl_new_Float_Box_from_BD_Shape_int32_t,
354
ppl_new_Float_Box_from_BD_Shape_int32_t_with_complexity,
355
ppl_new_Float_Box_from_BD_Shape_int64_t,
354
ppl_new_Float_Box_from_BD_Shape_int64_t_with_complexity,
355
ppl_new_Float_Box_from_BD_Shape_int8_t,
354
ppl_new_Float_Box_from_BD_Shape_int8_t_with_complexity,
355
ppl_new_Float_Box_from_BD_Shape_long_double,
354
ppl_new_Float_Box_from_BD_Shape_long_double_with_complexity,
356
ppl_new_Float_Box_from_BD_Shape_mpq_class,
354
ppl_new_Float_Box_from_BD_Shape_mpq_class_with_complexity,
355
ppl_new_Float_Box_from_BD_Shape_mpz_class,
354
ppl_new_Float_Box_from_BD_Shape_mpz_class_with_complexity,
355
ppl_new_Float_Box_from_C_Polyhedron,
354
ppl_new_Float_Box_from_C_Polyhedron_with_complexity,
355
ppl_new_Float_Box_from_congruences,
356
ppl_new_Float_Box_from_constraints,
356
ppl_new_Float_Box_from_Double_Box,
354
ppl_new_Float_Box_from_Double_Box_with_complexity,
356
ppl_new_Float_Box_from_Float_Box,
354
ppl_new_Float_Box_from_Float_Box_with_complexity,
356
ppl_new_Float_Box_from_generators,
356
ppl_new_Float_Box_from_Grid, 354
ppl_new_Float_Box_from_Grid_with_complexity,
356
ppl_new_Float_Box_from_Int16_Box,
353
ppl_new_Float_Box_from_Int16_Box_with_complexity,
354
ppl_new_Float_Box_from_Int32_Box,
353
ppl_new_Float_Box_from_Int32_Box_with_complexity,
354
ppl_new_Float_Box_from_Int64_Box,
353
ppl_new_Float_Box_from_Int64_Box_with_complexity,
354
ppl_new_Float_Box_from_Int8_Box, 353
ppl_new_Float_Box_from_Int8_Box_with_complexity,
354
ppl_new_Float_Box_from_Long_Double_Box,
354
ppl_new_Float_Box_from_Long_Double_Box_with_complexity,
356
ppl_new_Float_Box_from_NNC_Polyhedron,
354
ppl_new_Float_Box_from_NNC_Polyhedron_with_complexity,
356
ppl_new_Float_Box_from_Octagonal_Shape_double,
354
ppl_new_Float_Box_from_Octagonal_Shape_double_with_complexity,
356
ppl_new_Float_Box_from_Octagonal_Shape_float,
354
ppl_new_Float_Box_from_Octagonal_Shape_float_with_complexity,
356
ppl_new_Float_Box_from_Octagonal_Shape_int16_t,
354

ppl_new_Float_Box_from_Octagonal_Shape_int128_t_with_complexity, 355
ppl_new_Float_Box_from_Octagonal_Shape_int32_t, 354
ppl_new_Float_Box_from_Octagonal_Shape_int32_t_with_complexity, 355
ppl_new_Float_Box_from_Octagonal_Shape_int64_t, 354
ppl_new_Float_Box_from_Octagonal_Shape_int64_t_with_complexity, 355
ppl_new_Float_Box_from_Octagonal_Shape_int8_t, 354
ppl_new_Float_Box_from_Octagonal_Shape_int8_t_with_complexity, 355
ppl_new_Float_Box_from_Octagonal_Shape_long_double, 354
ppl_new_Float_Box_from_Octagonal_Shape_long_double_with_complexity, 356
ppl_new_Float_Box_from_Octagonal_Shape_mpq_class, 354
ppl_new_Float_Box_from_Octagonal_Shape_mpq_class_with_complexity, 355
ppl_new_Float_Box_from_Octagonal_Shape_mpz_class, 354
ppl_new_Float_Box_from_Octagonal_Shape_mpz_class_with_complexity, 355
ppl_new_Float_Box_from_Rational_Box, 354
ppl_new_Float_Box_from_Rational_Box_with_complexity, 355
ppl_new_Float_Box_from_space_dimension, 353
ppl_new_Float_Box_from_Uint16_Box, 353
ppl_new_Float_Box_from_Uint16_Box_with_complexity, 355
ppl_new_Float_Box_from_Uint32_Box, 353
ppl_new_Float_Box_from_Uint32_Box_with_complexity, 355
ppl_new_Float_Box_from_Uint64_Box, 353
ppl_new_Float_Box_from_Uint64_Box_with_complexity, 355
ppl_new_Float_Box_from_Uint8_Box, 353
ppl_new_Float_Box_from_Uint8_Box_with_complexity, 355
ppl_new_Float_Box_from_Z_Box, 354
ppl_new_Float_Box_from_Z_Box_with_complexity, 355
ppl_new_Grid_from_BD_Shape_double, 200
ppl_new_Grid_from_BD_Shape_double_with_complexity, 201
ppl_new_Grid_from_BD_Shape_float, 200
ppl_new_Grid_from_BD_Shape_float_with_complexity, 201
ppl_new_Grid_from_BD_Shape_int16_t, 199
ppl_new_Grid_from_BD_Shape_int16_t_with_complexity, 200
ppl_new_Grid_from_BD_Shape_int32_t, 199
ppl_new_Grid_from_BD_Shape_int32_t_with_complexity, 200
ppl_new_Grid_from_BD_Shape_int64_t, 199
ppl_new_Grid_from_BD_Shape_int64_t_with_complexity, 200
ppl_new_Grid_from_BD_Shape_int8_t, 199
ppl_new_Grid_from_BD_Shape_int8_t_with_complexity, 200
ppl_new_Grid_from_BD_Shape_long_double, 200
ppl_new_Grid_from_BD_Shape_long_double_with_complexity, 201
ppl_new_Grid_from_BD_Shape_mpq_class, 199
ppl_new_Grid_from_BD_Shape_mpq_class_with_complexity, 200
ppl_new_Grid_from_BD_Shape_mpz_class, 199
ppl_new_Grid_from_BD_Shape_mpz_class_with_complexity, 200
ppl_new_Grid_from_C_Polyhedron, 200
ppl_new_Grid_from_C_Polyhedron_with_complexity, 201
ppl_new_Grid_from_congruences, 201
ppl_new_Grid_from_constraints, 201
ppl_new_Grid_from_Double_Box, 200
ppl_new_Grid_from_Double_Box_with_complexity, 201
ppl_new_Grid_from_Float_Box, 200
ppl_new_Grid_from_Float_Box_with_complexity, 201
ppl_new_Grid_from_Grid, 200
ppl_new_Grid_from_grid_generators, 201
ppl_new_Grid_from_Grid_with_complexity, 201
ppl_new_Grid_from_Int16_Box, 199
ppl_new_Grid_from_Int16_Box_with_complexity, 200
ppl_new_Grid_from_Int32_Box, 199

ppl_new_Grid_from_Int32_Box_with_complexity, 200
ppl_new_Grid_from_Int64_Box, 199
ppl_new_Grid_from_Int64_Box_with_complexity, 200
ppl_new_Grid_from_Int8_Box, 199
ppl_new_Grid_from_Int8_Box_with_complexity, 200
ppl_new_Grid_from_Long_Double_Box, 200
ppl_new_Grid_from_Long_Double_Box_with_complexity, 201
ppl_new_Grid_from_NNC_Polyhedron, 200
ppl_new_Grid_from_NNC_Polyhedron_with_complexity, 201
ppl_new_Grid_from_Octagonal_Shape_double, 200
ppl_new_Grid_from_Octagonal_Shape_double_with_complexity, 201
ppl_new_Grid_from_Octagonal_Shape_float, 200
ppl_new_Grid_from_Octagonal_Shape_float_with_complexity, 201
ppl_new_Grid_from_Octagonal_Shape_int16_t, 199
ppl_new_Grid_from_Octagonal_Shape_int16_t_with_complexity, 201
ppl_new_Grid_from_Octagonal_Shape_int32_t, 199
ppl_new_Grid_from_Octagonal_Shape_int32_t_with_complexity, 201
ppl_new_Grid_from_Octagonal_Shape_int64_t, 199
ppl_new_Grid_from_Octagonal_Shape_int64_t_with_complexity, 201
ppl_new_Grid_from_Octagonal_Shape_int8_t, 199
ppl_new_Grid_from_Octagonal_Shape_int8_t_with_complexity, 201
ppl_new_Grid_from_Octagonal_Shape_long_double, 200
ppl_new_Grid_from_Octagonal_Shape_long_double_with_complexity, 201
ppl_new_Grid_from_Octagonal_Shape_mpq_class, 200
ppl_new_Grid_from_Octagonal_Shape_mpq_class_with_complexity, 201
ppl_new_Grid_from_Octagonal_Shape_mpz_class, 199
ppl_new_Grid_from_Octagonal_Shape_mpz_class_with_complexity, 201
ppl_new_Grid_from_Rational_Box, 199
ppl_new_Grid_from_Rational_Box_with_complexity, 200
ppl_new_Grid_from_space_dimension, 199
ppl_new_Grid_from_Uint16_Box, 199
ppl_new_Grid_from_Uint16_Box_with_complexity, 200
ppl_new_Grid_from_Uint32_Box, 199
ppl_new_Grid_from_Uint32_Box_with_complexity, 200
ppl_new_Grid_from_Uint64_Box, 199
ppl_new_Grid_from_Uint64_Box_with_complexity, 200
ppl_new_Grid_from_Uint8_Box, 199
ppl_new_Grid_from_Uint8_Box_with_complexity, 200
ppl_new_Grid_from_Z_Box, 199
ppl_new_Grid_from_Z_Box_with_complexity, 200
ppl_new_Int16_Box_from_BD_Shape_double, 32
ppl_new_Int16_Box_from_BD_Shape_double_with_complexity, 34
ppl_new_Int16_Box_from_BD_Shape_float, 32
ppl_new_Int16_Box_from_BD_Shape_float_with_complexity, 34
ppl_new_Int16_Box_from_BD_Shape_int16_t, 32
ppl_new_Int16_Box_from_BD_Shape_int16_t_with_complexity, 33
ppl_new_Int16_Box_from_BD_Shape_int32_t, 32
ppl_new_Int16_Box_from_BD_Shape_int32_t_with_complexity, 33
ppl_new_Int16_Box_from_BD_Shape_int64_t, 32
ppl_new_Int16_Box_from_BD_Shape_int64_t_with_complexity, 33
ppl_new_Int16_Box_from_BD_Shape_int8_t, 32
ppl_new_Int16_Box_from_BD_Shape_int8_t_with_complexity, 33
ppl_new_Int16_Box_from_BD_Shape_long_double, 32
ppl_new_Int16_Box_from_BD_Shape_long_double_with_complexity, 34
ppl_new_Int16_Box_from_BD_Shape_mpq_class, 32
ppl_new_Int16_Box_from_BD_Shape_mpq_class_with_complexity, 33
ppl_new_Int16_Box_from_BD_Shape_mpz_class, 32
ppl_new_Int16_Box_from_BD_Shape_mpz_class_with_complexity, 33

ppl_new_Int16_Box_from_C_Polyhedron, 32
ppl_new_Int16_Box_from_C_Polyhedron_with_complexity, 33
ppl_new_Int16_Box_from_congruences, 34
ppl_new_Int16_Box_from_constraints, 34
ppl_new_Int16_Box_from_Double_Box, 32
ppl_new_Int16_Box_from_Double_Box_with_complexity, 34
ppl_new_Int16_Box_from_Float_Box, 32
ppl_new_Int16_Box_from_Float_Box_with_complexity, 34
ppl_new_Int16_Box_from_generators, 34
ppl_new_Int16_Box_from_Grid, 32
ppl_new_Int16_Box_from_Grid_with_complexity, 34
ppl_new_Int16_Box_from_Int16_Box, 31
ppl_new_Int16_Box_from_Int16_Box_with_complexity, 32
ppl_new_Int16_Box_from_Int32_Box, 31
ppl_new_Int16_Box_from_Int32_Box_with_complexity, 32
ppl_new_Int16_Box_from_Int64_Box, 31
ppl_new_Int16_Box_from_Int64_Box_with_complexity, 32
ppl_new_Int16_Box_from_Int8_Box, 31
ppl_new_Int16_Box_from_Int8_Box_with_complexity, 32
ppl_new_Int16_Box_from_Long_Double_Box, 32
ppl_new_Int16_Box_from_Long_Double_Box_with_complexity, 34
ppl_new_Int16_Box_from_NNC_Polyhedron, 32
ppl_new_Int16_Box_from_NNC_Polyhedron_with_complexity, 34
ppl_new_Int16_Box_from_Octagonal_Shape_double, 32
ppl_new_Int16_Box_from_Octagonal_Shape_double_with_complexity, 34
ppl_new_Int16_Box_from_Octagonal_Shape_float, 32
ppl_new_Int16_Box_from_Octagonal_Shape_float_with_complexity, 34
ppl_new_Int16_Box_from_Octagonal_Shape_int32_t, 32
ppl_new_Int16_Box_from_Octagonal_Shape_int32_t_with_complexity, 33
ppl_new_Int16_Box_from_Octagonal_Shape_int64_t, 32
ppl_new_Int16_Box_from_Octagonal_Shape_int64_t_with_complexity, 33
ppl_new_Int16_Box_from_Octagonal_Shape_int8_t, 32
ppl_new_Int16_Box_from_Octagonal_Shape_int8_t_with_complexity, 33
ppl_new_Int16_Box_from_Octagonal_Shape_long_double, 32
ppl_new_Int16_Box_from_Octagonal_Shape_long_double_with_complexity, 34
ppl_new_Int16_Box_from_Octagonal_Shape_mpq_class, 32
ppl_new_Int16_Box_from_Octagonal_Shape_mpq_class_with_complexity, 33
ppl_new_Int16_Box_from_Octagonal_Shape_mpz_class, 32
ppl_new_Int16_Box_from_Octagonal_Shape_mpz_class_with_complexity, 33
ppl_new_Int16_Box_from_Rational_Box, 32
ppl_new_Int16_Box_from_Rational_Box_with_complexity, 33
ppl_new_Int16_Box_from_space_dimension, 31
ppl_new_Int16_Box_from_Uint16_Box, 31
ppl_new_Int16_Box_from_Uint16_Box_with_complexity, 33
ppl_new_Int16_Box_from_Uint32_Box, 31
ppl_new_Int16_Box_from_Uint32_Box_with_complexity, 33
ppl_new_Int16_Box_from_Uint64_Box, 32
ppl_new_Int16_Box_from_Uint64_Box_with_complexity, 33
ppl_new_Int16_Box_from_Uint8_Box, 31
ppl_new_Int16_Box_from_Uint8_Box_with_complexity, 33
ppl_new_Int16_Box_from_Z_Box, 32
ppl_new_Int16_Box_from_Z_Box_with_complexity, 33
ppl_new_Int32_Box_from_BD_Shape_double, 38
ppl_new_Int32_Box_from_BD_Shape_double_with_complexity, 40
ppl_new_Int32_Box_from_BD_Shape_float, 38
ppl_new_Int32_Box_from_BD_Shape_float_with_complexity, 40

ppl_new_Int32_Box_from_BD_Shape_int16, 38
ppl_new_Int32_Box_from_BD_Shape_int16_t_with_complexity, 39
ppl_new_Int32_Box_from_BD_Shape_int32, 38
ppl_new_Int32_Box_from_BD_Shape_int32_t_with_complexity, 39
ppl_new_Int32_Box_from_BD_Shape_int64, 38
ppl_new_Int32_Box_from_BD_Shape_int64_t_with_complexity, 39
ppl_new_Int32_Box_from_BD_Shape_int8, 38
ppl_new_Int32_Box_from_BD_Shape_int8_t_with_complexity, 39
ppl_new_Int32_Box_from_BD_Shape_long_double, 39
ppl_new_Int32_Box_from_BD_Shape_long_double_with_complexity, 40
ppl_new_Int32_Box_from_BD_Shape_mpq_class, 38
ppl_new_Int32_Box_from_BD_Shape_mpq_class_with_complexity, 39
ppl_new_Int32_Box_from_BD_Shape_mpz_class, 38
ppl_new_Int32_Box_from_BD_Shape_mpz_class_with_complexity, 39
ppl_new_Int32_Box_from_C_Polyhedron, 38
ppl_new_Int32_Box_from_C_Polyhedron_with_complexity, 40
ppl_new_Int32_Box_from_congruences, 40
ppl_new_Int32_Box_from_constraints, 40
ppl_new_Int32_Box_from_Double_Box, 38
ppl_new_Int32_Box_from_Double_Box_with_complexity, 40
ppl_new_Int32_Box_from_Float_Box, 38
ppl_new_Int32_Box_from_Float_Box_with_complexity, 40
ppl_new_Int32_Box_from_generators, 40
ppl_new_Int32_Box_from_Grid, 38
ppl_new_Int32_Box_from_Grid_with_complexity, 40
ppl_new_Int32_Box_from_Int16_Box, 38
ppl_new_Int32_Box_from_Int16_Box_with_complexity, 39
ppl_new_Int32_Box_from_Int32_Box, 38
ppl_new_Int32_Box_from_Int32_Box_with_complexity, 39
ppl_new_Int32_Box_from_Int64_Box, 38
ppl_new_Int32_Box_from_Int64_Box_with_complexity, 39
ppl_new_Int32_Box_from_Int8_Box, 38
ppl_new_Int32_Box_from_Int8_Box_with_complexity, 39
ppl_new_Int32_Box_from_Long_Double_Box, 39
ppl_new_Int32_Box_from_Long_Double_Box_with_complexity, 40
ppl_new_Int32_Box_from_NNC_Polyhedron, 38
ppl_new_Int32_Box_from_NNC_Polyhedron_with_complexity, 40
ppl_new_Int32_Box_from_Octagonal_Shape_double, 39
ppl_new_Int32_Box_from_Octagonal_Shape_double_with_complexity, 40
ppl_new_Int32_Box_from_Octagonal_Shape_float, 38
ppl_new_Int32_Box_from_Octagonal_Shape_float_with_complexity, 40
ppl_new_Int32_Box_from_Octagonal_Shape_int16_t, 38
ppl_new_Int32_Box_from_Octagonal_Shape_int16_t_with_complexity, 40
ppl_new_Int32_Box_from_Octagonal_Shape_int32_t, 38
ppl_new_Int32_Box_from_Octagonal_Shape_int32_t_with_complexity, 40
ppl_new_Int32_Box_from_Octagonal_Shape_int64_t, 38
ppl_new_Int32_Box_from_Octagonal_Shape_int64_t_with_complexity, 40
ppl_new_Int32_Box_from_Octagonal_Shape_int8_t, 38
ppl_new_Int32_Box_from_Octagonal_Shape_int8_t_with_complexity, 39
ppl_new_Int32_Box_from_Octagonal_Shape_long_double, 39
ppl_new_Int32_Box_from_Octagonal_Shape_long_double_with_complexity, 40
ppl_new_Int32_Box_from_Octagonal_Shape_mpq_class, 38
ppl_new_Int32_Box_from_Octagonal_Shape_mpq_class_with_complexity, 40
ppl_new_Int32_Box_from_Octagonal_Shape_mpz_class, 38
ppl_new_Int32_Box_from_Octagonal_Shape_mpz_class_with_complexity, 40
ppl_new_Int32_Box_from_Rational_Box, 38
ppl_new_Int32_Box_from_Rational_Box_with_complexity, 39

ppl_new_Int32_Box_from_space_dimension, 38
ppl_new_Int32_Box_from_Uint16_Box, 38
ppl_new_Int32_Box_from_Uint16_Box_with_complexity, 39
ppl_new_Int32_Box_from_Uint32_Box, 38
ppl_new_Int32_Box_from_Uint32_Box_with_complexity, 39
ppl_new_Int32_Box_from_Uint64_Box, 38
ppl_new_Int32_Box_from_Uint64_Box_with_complexity, 39
ppl_new_Int32_Box_from_Uint8_Box, 38
ppl_new_Int32_Box_from_Uint8_Box_with_complexity, 39
ppl_new_Int32_Box_from_Z_Box, 38
ppl_new_Int32_Box_from_Z_Box_with_complexity, 39
ppl_new_Int64_Box_from_BD_Shape_double, 45
ppl_new_Int64_Box_from_BD_Shape_double_with_complexity, 46
ppl_new_Int64_Box_from_BD_Shape_float, 45
ppl_new_Int64_Box_from_BD_Shape_float_with_complexity, 46
ppl_new_Int64_Box_from_BD_Shape_int16_t, 44
ppl_new_Int64_Box_from_BD_Shape_int16_t_with_complexity, 45
ppl_new_Int64_Box_from_BD_Shape_int32_t, 44
ppl_new_Int64_Box_from_BD_Shape_int32_t_with_complexity, 46
ppl_new_Int64_Box_from_BD_Shape_int64_t, 44
ppl_new_Int64_Box_from_BD_Shape_int64_t_with_complexity, 46
ppl_new_Int64_Box_from_BD_Shape_int8_t, 44
ppl_new_Int64_Box_from_BD_Shape_int8_t_with_complexity, 45
ppl_new_Int64_Box_from_BD_Shape_long_double, 45
ppl_new_Int64_Box_from_BD_Shape_long_double_with_complexity, 47
ppl_new_Int64_Box_from_BD_Shape_mpq_class, 44
ppl_new_Int64_Box_from_BD_Shape_mpq_class_with_complexity, 46
ppl_new_Int64_Box_from_BD_Shape_mpz_class, 44
ppl_new_Int64_Box_from_BD_Shape_mpz_class_with_complexity, 46
ppl_new_Int64_Box_from_C_Polyhedron, 45
ppl_new_Int64_Box_from_C_Polyhedron_with_complexity, 46
ppl_new_Int64_Box_from_congruences, 47
ppl_new_Int64_Box_from_constraints, 47
ppl_new_Int64_Box_from_Double_Box, 45
ppl_new_Int64_Box_from_Double_Box_with_complexity, 46
ppl_new_Int64_Box_from_Float_Box, 45
ppl_new_Int64_Box_from_Float_Box_with_complexity, 46
ppl_new_Int64_Box_from_generators, 47
ppl_new_Int64_Box_from_Grid, 45
ppl_new_Int64_Box_from_Grid_with_complexity, 46
ppl_new_Int64_Box_from_Int16_Box, 44
ppl_new_Int64_Box_from_Int16_Box_with_complexity, 45
ppl_new_Int64_Box_from_Int32_Box, 44
ppl_new_Int64_Box_from_Int32_Box_with_complexity, 45
ppl_new_Int64_Box_from_Int64_Box, 44
ppl_new_Int64_Box_from_Int64_Box_with_complexity, 45
ppl_new_Int64_Box_from_Int8_Box, 44
ppl_new_Int64_Box_from_Int8_Box_with_complexity, 45
ppl_new_Int64_Box_from_Long_Double_Box, 45
ppl_new_Int64_Box_from_Long_Double_Box_with_complexity, 47
ppl_new_Int64_Box_from_NNC_Polyhedron, 45
ppl_new_Int64_Box_from_NNC_Polyhedron_with_complexity, 46
ppl_new_Int64_Box_from_Octagonal_Shape_double, 45
ppl_new_Int64_Box_from_Octagonal_Shape_double_with_complexity, 46
ppl_new_Int64_Box_from_Octagonal_Shape_float, 45
ppl_new_Int64_Box_from_Octagonal_Shape_float_with_complexity, 46
ppl_new_Int64_Box_from_Octagonal_Shape_int16_t, 44
ppl_new_Int64_Box_from_Octagonal_Shape_int16_t_with_complexity, 46

ppl_new_Int64_Box_from_Octagonal_Shape, 44
ppl_new_Int64_Box_from_Octagonal_Shape, 46
ppl_new_Int64_Box_from_Octagonal_Shape, 44
ppl_new_Int64_Box_from_Octagonal_Shape, 46
ppl_new_Int64_Box_from_Octagonal_Shape, 44
ppl_new_Int64_Box_from_Octagonal_Shape, 46
ppl_new_Int64_Box_from_Octagonal_Shape, 45
ppl_new_Int64_Box_from_Octagonal_Shape, 47
ppl_new_Int64_Box_from_Octagonal_Shape, 45
ppl_new_Int64_Box_from_Octagonal_Shape, 46
ppl_new_Int64_Box_from_Octagonal_Shape, 45
ppl_new_Int64_Box_from_Octagonal_Shape, 46
ppl_new_Int64_Box_from_Rational_Box, 44
ppl_new_Int64_Box_from_Rational_Box_with_complexity, 45
ppl_new_Int64_Box_from_space_dimension, 44
ppl_new_Int64_Box_from_Uint16_Box, 44
ppl_new_Int64_Box_from_Uint16_Box_with_complexity, 45
ppl_new_Int64_Box_from_Uint32_Box, 44
ppl_new_Int64_Box_from_Uint32_Box_with_complexity, 45
ppl_new_Int64_Box_from_Uint64_Box, 44
ppl_new_Int64_Box_from_Uint64_Box_with_complexity, 45
ppl_new_Int64_Box_from_Uint8_Box, 44
ppl_new_Int64_Box_from_Uint8_Box_with_complexity, 45
ppl_new_Int64_Box_from_Z_Box, 44
ppl_new_Int64_Box_from_Z_Box_with_complexity, 45
ppl_new_Int8_Box_from_BD_Shape_double, 26
ppl_new_Int8_Box_from_BD_Shape_double_with_complexity, 28
ppl_new_Int8_Box_from_BD_Shape_float, 26
ppl_new_Int8_Box_from_BD_Shape_float_with_complexity, 28
ppl_new_Int8_Box_from_BD_Shape_int16_t, 26
ppl_new_Int8_Box_from_BD_Shape_int16_t_with_complexity, 27
ppl_new_Int8_Box_from_BD_Shape_int32_t, 26
ppl_new_Int8_Box_from_BD_Shape_int32_t_with_complexity, 27
ppl_new_Int8_Box_from_BD_Shape_int64_t, 26
ppl_new_Int8_Box_from_BD_Shape_int64_t_with_complexity, 27
ppl_new_Int8_Box_from_BD_Shape_int8_t, 26
ppl_new_Int8_Box_from_BD_Shape_int8_t_with_complexity, 27
ppl_new_Int8_Box_from_BD_Shape_long_double, 26
ppl_new_Int8_Box_from_BD_Shape_long_double_with_complexity, 28
ppl_new_Int8_Box_from_BD_Shape_mpq_class, 26
ppl_new_Int8_Box_from_BD_Shape_mpq_class_with_complexity, 27
ppl_new_Int8_Box_from_BD_Shape_mpz_class, 26
ppl_new_Int8_Box_from_BD_Shape_mpz_class_with_complexity, 27
ppl_new_Int8_Box_from_C_Polyhedron, 26
ppl_new_Int8_Box_from_C_Polyhedron_with_complexity, 27
ppl_new_Int8_Box_from_congruences, 28
ppl_new_Int8_Box_from_constraints, 28
ppl_new_Int8_Box_from_Double_Box, 26
ppl_new_Int8_Box_from_Double_Box_with_complexity, 28
ppl_new_Int8_Box_from_Float_Box, 26
ppl_new_Int8_Box_from_Float_Box_with_complexity, 28
ppl_new_Int8_Box_from_generators, 28
ppl_new_Int8_Box_from_Grid, 26
ppl_new_Int8_Box_from_Grid_with_complexity, 27
ppl_new_Int8_Box_from_Int16_Box, 25
ppl_new_Int8_Box_from_Int16_Box_with_complexity, 26
ppl_new_Int8_Box_from_Int32_Box, 25
ppl_new_Int8_Box_from_Int32_Box_with_complexity, 26

ppl_new_Int8_Box_from_Int64_Box, 25
ppl_new_Int8_Box_from_Int64_Box_with_complexity, 26
ppl_new_Int8_Box_from_Int8_Box, 25
ppl_new_Int8_Box_from_Int8_Box_with_complexity, 26
ppl_new_Int8_Box_from_Long_Double_Box, 26
ppl_new_Int8_Box_from_Long_Double_Box_with_complexity, 28
ppl_new_Int8_Box_from_NNC_Polyhedron, 26
ppl_new_Int8_Box_from_NNC_Polyhedron_with_complexity, 27
ppl_new_Int8_Box_from_Octagonal_Shape_double, 26
ppl_new_Int8_Box_from_Octagonal_Shape_double_with_complexity, 28
ppl_new_Int8_Box_from_Octagonal_Shape_float, 26
ppl_new_Int8_Box_from_Octagonal_Shape_float_with_complexity, 28
ppl_new_Int8_Box_from_Octagonal_Shape_int16_t, 26
ppl_new_Int8_Box_from_Octagonal_Shape_int16_t_with_complexity, 27
ppl_new_Int8_Box_from_Octagonal_Shape_int32_t, 26
ppl_new_Int8_Box_from_Octagonal_Shape_int32_t_with_complexity, 27
ppl_new_Int8_Box_from_Octagonal_Shape_int64_t, 26
ppl_new_Int8_Box_from_Octagonal_Shape_int64_t_with_complexity, 27
ppl_new_Int8_Box_from_Octagonal_Shape_int8_t, 26
ppl_new_Int8_Box_from_Octagonal_Shape_int8_t_with_complexity, 27
ppl_new_Int8_Box_from_Octagonal_Shape_long_double, 26
ppl_new_Int8_Box_from_Octagonal_Shape_long_double_with_complexity, 28
ppl_new_Int8_Box_from_Octagonal_Shape_mpq_class, 26
ppl_new_Int8_Box_from_Octagonal_Shape_mpq_class_with_complexity, 27
ppl_new_Int8_Box_from_Octagonal_Shape_mpz_class, 26
ppl_new_Int8_Box_from_Octagonal_Shape_mpz_class_with_complexity, 27
ppl_new_Int8_Box_from_Rational_Box, 25
ppl_new_Int8_Box_from_Rational_Box_with_complexity, 27
ppl_new_Int8_Box_from_space_dimension, 25
ppl_new_Int8_Box_from_Uint16_Box, 25
ppl_new_Int8_Box_from_Uint16_Box_with_complexity, 26
ppl_new_Int8_Box_from_Uint32_Box, 25
ppl_new_Int8_Box_from_Uint32_Box_with_complexity, 27
ppl_new_Int8_Box_from_Uint64_Box, 25
ppl_new_Int8_Box_from_Uint64_Box_with_complexity, 27
ppl_new_Int8_Box_from_Uint8_Box, 25
ppl_new_Int8_Box_from_Uint8_Box_with_complexity, 26
ppl_new_Int8_Box_from_Z_Box, 25
ppl_new_Int8_Box_from_Z_Box_with_complexity, 27
ppl_new_Long_Double_Box_from_BD_Shape_double, 427
ppl_new_Long_Double_Box_from_BD_Shape_double_with_complexity, 429
ppl_new_Long_Double_Box_from_BD_Shape_float, 427
ppl_new_Long_Double_Box_from_BD_Shape_float_with_complexity, 429
ppl_new_Long_Double_Box_from_BD_Shape_int16_t, 427
ppl_new_Long_Double_Box_from_BD_Shape_int16_t_with_complexity, 428
ppl_new_Long_Double_Box_from_BD_Shape_int32_t, 427
ppl_new_Long_Double_Box_from_BD_Shape_int32_t_with_complexity, 428
ppl_new_Long_Double_Box_from_BD_Shape_int64_t, 427
ppl_new_Long_Double_Box_from_BD_Shape_int64_t_with_complexity, 428
ppl_new_Long_Double_Box_from_BD_Shape_int8_t, 427
ppl_new_Long_Double_Box_from_BD_Shape_int8_t_with_complexity, 428
ppl_new_Long_Double_Box_from_BD_Shape_long_double, 427
ppl_new_Long_Double_Box_from_BD_Shape_long_double_with_complexity, 429
ppl_new_Long_Double_Box_from_BD_Shape_mpq_class, 427
ppl_new_Long_Double_Box_from_BD_Shape_mpq_class_with_complexity, 428
ppl_new_Long_Double_Box_from_BD_Shape_mpz_class, 427
ppl_new_Long_Double_Box_from_BD_Shape_mpz_class_with_complexity, 428

ppl_new_Long_Double_Box_from_C_Polyhedron,
427
ppl_new_Long_Double_Box_from_C_Polyhedron_with_complexity,
429
ppl_new_Long_Double_Box_from_congruences,
429
ppl_new_Long_Double_Box_from_constraints,
429
ppl_new_Long_Double_Box_from_Double_Box,
427
ppl_new_Long_Double_Box_from_Double_Box_with_complexity,
429
ppl_new_Long_Double_Box_from_Float_Box,
427
ppl_new_Long_Double_Box_from_Float_Box_with_complexity,
429
ppl_new_Long_Double_Box_from_generators,
430
ppl_new_Long_Double_Box_from_Grid,
427
ppl_new_Long_Double_Box_from_Grid_with_complexity,
429
ppl_new_Long_Double_Box_from_Int16_Box,
426
ppl_new_Long_Double_Box_from_Int16_Box_with_complexity,
428
ppl_new_Long_Double_Box_from_Int32_Box,
426
ppl_new_Long_Double_Box_from_Int32_Box_with_complexity,
428
ppl_new_Long_Double_Box_from_Int64_Box,
426
ppl_new_Long_Double_Box_from_Int64_Box_with_complexity,
428
ppl_new_Long_Double_Box_from_Int8_Box,
426
ppl_new_Long_Double_Box_from_Int8_Box_with_complexity,
427
ppl_new_Long_Double_Box_from_Long_Double_Box,
427
ppl_new_Long_Double_Box_from_Long_Double_Box_with_complexity,
429
ppl_new_Long_Double_Box_from_NNC_Polyhedron,
427
ppl_new_Long_Double_Box_from_NNC_Polyhedron_with_complexity,
429
ppl_new_Long_Double_Box_from_Octagonal_Shape_Long_Double,
427
ppl_new_Long_Double_Box_from_Octagonal_Shape_Long_Double_with_complexity,
429
ppl_new_Long_Double_Box_from_Octagonal_Shape_Long_Float,
427
ppl_new_Long_Double_Box_from_Octagonal_Shape_Long_Float_with_complexity,
429
ppl_new_Long_Double_Box_from_Octagonal_Shape_int16,
427
ppl_new_Long_Double_Box_from_Octagonal_Shape_int16_with_complexity,
428
ppl_new_Long_Double_Box_from_Octagonal_Shape_int32,
427
ppl_new_Long_Double_Box_from_Octagonal_Shape_int32_with_complexity,
429
ppl_new_Long_Double_Box_from_Octagonal_Shape_int64,
427
ppl_new_Long_Double_Box_from_Octagonal_Shape_int64_with_complexity,
428
ppl_new_Long_Double_Box_from_Octagonal_Shape_int8,
427
ppl_new_Long_Double_Box_from_Octagonal_Shape_int8_with_complexity,
428
ppl_new_Long_Double_Box_from_Octagonal_Shape_long,
427
ppl_new_Long_Double_Box_from_Octagonal_Shape_long_with_complexity,
429
ppl_new_Long_Double_Box_from_Octagonal_Shape_mpq_class,
427
ppl_new_Long_Double_Box_from_Octagonal_Shape_mpq_class_with_complexity,
429
ppl_new_Long_Double_Box_from_Octagonal_Shape_mpz_class,
427
ppl_new_Long_Double_Box_from_Octagonal_Shape_mpz_class_with_complexity,
429
ppl_new_Long_Double_Box_from_Rational_Box,
427
ppl_new_Long_Double_Box_from_Rational_Box_with_complexity,
428
ppl_new_Long_Double_Box_from_space_dimension,
426
ppl_new_Long_Double_Box_from_Uint16_Box,
426
ppl_new_Long_Double_Box_from_Uint16_Box_with_complexity,
428
ppl_new_Long_Double_Box_from_Uint32_Box,
426
ppl_new_Long_Double_Box_from_Uint32_Box_with_complexity,
428
ppl_new_Long_Double_Box_from_Uint64_Box,
426
ppl_new_Long_Double_Box_from_Uint64_Box_with_complexity,
428
ppl_new_Long_Double_Box_from_Uint8_Box,
426
ppl_new_Long_Double_Box_from_Uint8_Box_with_complexity,
428
ppl_new_Long_Double_Box_from_Z_Box,
426
ppl_new_Long_Double_Box_from_Z_Box_with_complexity,
428

ppl_new_MIP_Problem, 22
ppl_new_MIP_Problem_from_space_dimension, 22
ppl_new_NNC_Polyhedron_from_BD_Shape_double, 190
ppl_new_NNC_Polyhedron_from_BD_Shape_double_with_complexity, 193
ppl_new_NNC_Polyhedron_from_BD_Shape_float, 190
ppl_new_NNC_Polyhedron_from_BD_Shape_float_with_complexity, 193
ppl_new_NNC_Polyhedron_from_BD_Shape_int16, 189
ppl_new_NNC_Polyhedron_from_BD_Shape_int16_with_complexity, 191
ppl_new_NNC_Polyhedron_from_BD_Shape_int32, 189
ppl_new_NNC_Polyhedron_from_BD_Shape_int32_with_complexity, 192
ppl_new_NNC_Polyhedron_from_BD_Shape_int64, 189
ppl_new_NNC_Polyhedron_from_BD_Shape_int64_with_complexity, 192
ppl_new_NNC_Polyhedron_from_BD_Shape_int8, 189
ppl_new_NNC_Polyhedron_from_BD_Shape_int8_with_complexity, 191
ppl_new_NNC_Polyhedron_from_BD_Shape_long_double, 190
ppl_new_NNC_Polyhedron_from_BD_Shape_long_double_with_complexity, 194
ppl_new_NNC_Polyhedron_from_BD_Shape_mpq_class, 189
ppl_new_NNC_Polyhedron_from_BD_Shape_mpq_class_with_complexity, 192
ppl_new_NNC_Polyhedron_from_BD_Shape_mpz_class, 189
ppl_new_NNC_Polyhedron_from_BD_Shape_mpz_class_with_complexity, 192
ppl_new_NNC_Polyhedron_from_C_Polyhedron, 190
ppl_new_NNC_Polyhedron_from_C_Polyhedron_with_complexity, 193
ppl_new_NNC_Polyhedron_from_congruences, 194
ppl_new_NNC_Polyhedron_from_constraints, 194
ppl_new_NNC_Polyhedron_from_Double_Box, 190
ppl_new_NNC_Polyhedron_from_Double_Box_with_complexity, 193
ppl_new_NNC_Polyhedron_from_Float_Box, 190
ppl_new_NNC_Polyhedron_from_Float_Box_with_complexity, 193
ppl_new_NNC_Polyhedron_from_generators, 194
ppl_new_NNC_Polyhedron_from_Grid, 190
ppl_new_NNC_Polyhedron_from_Grid_with_complexity, 193
ppl_new_NNC_Polyhedron_from_Int16_Box, 188
ppl_new_NNC_Polyhedron_from_Int16_Box_with_complexity, 191
ppl_new_NNC_Polyhedron_from_Int32_Box, 188
ppl_new_NNC_Polyhedron_from_Int32_Box_with_complexity, 191
ppl_new_NNC_Polyhedron_from_Int64_Box, 188
ppl_new_NNC_Polyhedron_from_Int64_Box_with_complexity, 191
ppl_new_NNC_Polyhedron_from_Int8_Box, 188
ppl_new_NNC_Polyhedron_from_Int8_Box_with_complexity, 190
ppl_new_NNC_Polyhedron_from_Long_Double_Box, 190
ppl_new_NNC_Polyhedron_from_Long_Double_Box_with_complexity, 194
ppl_new_NNC_Polyhedron_from_NNC_Polyhedron, 190
ppl_new_NNC_Polyhedron_from_NNC_Polyhedron_with_complexity, 193
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_double, 190
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_double_with_complexity, 194
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_float, 190
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_float_with_complexity, 193
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int16, 189
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int16_with_complexity, 192
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int32, 189
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int32_with_complexity, 192
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int64, 190
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int64_with_complexity, 192
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int8, 189
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int8_with_complexity,

ppl_new_NNC_Polyhedron_from_Octagonal_Shape_double_from_BD_Shape_int 192
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_double_from_BD_Shape_int 190
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_double_from_BD_Shape_int 194
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_double_from_BD_Shape_int 190
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_double_from_BD_Shape_int 193
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_double_from_BD_Shape_lon 190
ppl_new_NNC_Polyhedron_from_Octagonal_Shape_double_from_BD_Shape_lon 193
ppl_new_NNC_Polyhedron_from_Rational_Box, 189
ppl_new_NNC_Polyhedron_from_Rational_Box_with_Complexity, 191
ppl_new_NNC_Polyhedron_from_space_dimension, 188
ppl_new_NNC_Polyhedron_from_Uint16_Box, 189
ppl_new_NNC_Polyhedron_from_Uint16_Box_with_Complexity, 191
ppl_new_NNC_Polyhedron_from_Uint32_Box, 189
ppl_new_NNC_Polyhedron_from_Uint32_Box_with_Complexity, 191
ppl_new_NNC_Polyhedron_from_Uint64_Box, 189
ppl_new_NNC_Polyhedron_from_Uint64_Box_with_Complexity, 191
ppl_new_NNC_Polyhedron_from_Uint8_Box, 188
ppl_new_NNC_Polyhedron_from_Uint8_Box_with_Complexity, 191
ppl_new_NNC_Polyhedron_from_Z_Box, 189
ppl_new_NNC_Polyhedron_from_Z_Box_with_Complexity, 191
ppl_new_Octagonal_Shape_double_from_BD_Shape, 405
ppl_new_Octagonal_Shape_double_from_BD_Shape_with_Complexity, 407
ppl_new_Octagonal_Shape_double_from_BD_Shape_with_Complexity, 405
ppl_new_Octagonal_Shape_double_from_BD_Shape_with_Complexity, 407
ppl_new_Octagonal_Shape_double_from_BD_Shape_with_Complexity, 404
ppl_new_Octagonal_Shape_double_from_BD_Shape_with_Complexity, 406
ppl_new_Octagonal_Shape_double_from_BD_Shape_with_Complexity, 404
ppl_new_Octagonal_Shape_double_from_BD_Shape_with_Complexity, 406
ppl_new_Octagonal_Shape_double_from_C_Polyhedron, 405
ppl_new_Octagonal_Shape_double_from_C_Polyhedron_with_Complexity, 407
ppl_new_Octagonal_Shape_double_from_congruences, 407
ppl_new_Octagonal_Shape_double_from_constraints, 407
ppl_new_Octagonal_Shape_double_from_Double_Box, 405
ppl_new_Octagonal_Shape_double_from_Double_Box_with_Complexity, 407
ppl_new_Octagonal_Shape_double_from_Float_Box, 405
ppl_new_Octagonal_Shape_double_from_Float_Box_with_Complexity, 407
ppl_new_Octagonal_Shape_double_from_generators, 407
ppl_new_Octagonal_Shape_double_from_Grid, 405
ppl_new_Octagonal_Shape_double_from_Grid_with_Complexity, 407
ppl_new_Octagonal_Shape_double_from_Int16_Box, 404
ppl_new_Octagonal_Shape_double_from_Int16_Box_with_Complexity, 405
ppl_new_Octagonal_Shape_double_from_Int32_Box, 404
ppl_new_Octagonal_Shape_double_from_Int32_Box_with_Complexity, 405
ppl_new_Octagonal_Shape_double_from_Int64_Box, 404
ppl_new_Octagonal_Shape_double_from_Int64_Box_with_Complexity, 406

ppl_new_Octagonal_Shape_double_from_Int8_Box, 405
ppl_new_Octagonal_Shape_double_from_Int8_Box_with_complexity, 404
ppl_new_Octagonal_Shape_double_from_Int16_Box, 404
ppl_new_Octagonal_Shape_double_from_Int16_Box_with_complexity, 404
ppl_new_Octagonal_Shape_double_from_Int32_Box, 405
ppl_new_Octagonal_Shape_double_from_Int32_Box_with_complexity, 404
ppl_new_Octagonal_Shape_double_from_Int64_Box, 407
ppl_new_Octagonal_Shape_double_from_Int64_Box_with_complexity, 406
ppl_new_Octagonal_Shape_double_from_NNC_Polyhedron, 405
ppl_new_Octagonal_Shape_double_from_NNC_Polyhedron_with_complexity, 404
ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_double, 407
ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_double_with_complexity, 406
ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_float, 405
ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_float_with_complexity, 404
ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_mpq, 407
ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_mpz, 406
ppl_new_Octagonal_Shape_double_from_Polyhedron, 405
ppl_new_Octagonal_Shape_double_from_Polyhedron_with_complexity, 404
ppl_new_Octagonal_Shape_double_from_Uint8_Box, 406
ppl_new_Octagonal_Shape_double_from_Uint8_Box_with_complexity, 404
ppl_new_Octagonal_Shape_double_from_Uint16_Box, 404
ppl_new_Octagonal_Shape_double_from_Uint16_Box_with_complexity, 406
ppl_new_Octagonal_Shape_double_from_Uint32_Box, 404
ppl_new_Octagonal_Shape_double_from_Uint32_Box_with_complexity, 406
ppl_new_Octagonal_Shape_double_from_Uint64_Box, 404
ppl_new_Octagonal_Shape_double_from_Uint64_Box_with_complexity, 406
ppl_new_Octagonal_Shape_double_from_Z_Box, 404
ppl_new_Octagonal_Shape_double_from_Z_Box_with_complexity, 406
ppl_new_Octagonal_Shape_float_from_BD_Shape_double, 368
ppl_new_Octagonal_Shape_float_from_BD_Shape_double_with_complexity, 370
ppl_new_Octagonal_Shape_float_from_BD_Shape_float, 368
ppl_new_Octagonal_Shape_float_from_BD_Shape_float_with_complexity, 370
ppl_new_Octagonal_Shape_float_from_BD_Shape_int16, 368
ppl_new_Octagonal_Shape_float_from_BD_Shape_int16_with_complexity, 369
ppl_new_Octagonal_Shape_float_from_BD_Shape_int32, 368
ppl_new_Octagonal_Shape_float_from_BD_Shape_int32_with_complexity, 369
ppl_new_Octagonal_Shape_float_from_BD_Shape_int64, 368
ppl_new_Octagonal_Shape_float_from_BD_Shape_int64_with_complexity, 369
ppl_new_Octagonal_Shape_float_from_BD_Shape_int8, 368
ppl_new_Octagonal_Shape_float_from_BD_Shape_int8_with_complexity, 369
ppl_new_Octagonal_Shape_float_from_BD_Shape_long, 369
ppl_new_Octagonal_Shape_float_from_BD_Shape_long_with_complexity, 371
ppl_new_Octagonal_Shape_float_from_BD_Shape_mpq, 368
ppl_new_Octagonal_Shape_float_from_BD_Shape_mpq_with_complexity, 370
ppl_new_Octagonal_Shape_float_from_BD_Shape_mpz, 369
ppl_new_Octagonal_Shape_float_from_BD_Shape_mpz_with_complexity, 371
ppl_new_Octagonal_Shape_float_from_Box, 368
ppl_new_Octagonal_Shape_float_from_Box_with_complexity, 370
ppl_new_Octagonal_Shape_float_from_Int8_Box, 368
ppl_new_Octagonal_Shape_float_from_Int8_Box_with_complexity, 369
ppl_new_Octagonal_Shape_float_from_Int16_Box, 368
ppl_new_Octagonal_Shape_float_from_Int16_Box_with_complexity, 369
ppl_new_Octagonal_Shape_float_from_Int32_Box, 368
ppl_new_Octagonal_Shape_float_from_Int32_Box_with_complexity, 369
ppl_new_Octagonal_Shape_float_from_Int64_Box, 368
ppl_new_Octagonal_Shape_float_from_Int64_Box_with_complexity, 369
ppl_new_Octagonal_Shape_float_from_NNC_Polyhedron, 368
ppl_new_Octagonal_Shape_float_from_NNC_Polyhedron_with_complexity, 370
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_double, 369
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_double_with_complexity, 371
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_float, 369
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_float_with_complexity, 371
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpq, 369
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpq_with_complexity, 371
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpz, 370
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpz_with_complexity, 372
ppl_new_Octagonal_Shape_float_from_Polyhedron, 368
ppl_new_Octagonal_Shape_float_from_Polyhedron_with_complexity, 370
ppl_new_Octagonal_Shape_float_from_space_dimension, 369

ppl_new_Octagonal_Shape_float_from_BD_Shape, 368
ppl_new_Octagonal_Shape_float_from_C_Polyhedron, 369
ppl_new_Octagonal_Shape_float_from_C_Polyhedron_with_complexity, 368
ppl_new_Octagonal_Shape_float_from_constraint, 370
ppl_new_Octagonal_Shape_float_from_constraints, 371
ppl_new_Octagonal_Shape_float_from_Double_Box, 371
ppl_new_Octagonal_Shape_float_from_Double_Box_with_complexity, 368
ppl_new_Octagonal_Shape_float_from_Float_Box, 370
ppl_new_Octagonal_Shape_float_from_Float_Box_with_complexity, 368
ppl_new_Octagonal_Shape_float_from_generator, 370
ppl_new_Octagonal_Shape_float_from_Grid, 371
ppl_new_Octagonal_Shape_float_from_Grid_with_complexity, 368
ppl_new_Octagonal_Shape_float_from_Int16_Box, 370
ppl_new_Octagonal_Shape_float_from_Int16_Box_with_complexity, 367
ppl_new_Octagonal_Shape_float_from_Int32_Box, 370
ppl_new_Octagonal_Shape_float_from_Int32_Box_with_complexity, 367
ppl_new_Octagonal_Shape_float_from_Int64_Box, 369
ppl_new_Octagonal_Shape_float_from_Int64_Box_with_complexity, 367
ppl_new_Octagonal_Shape_float_from_Int8_Box, 369
ppl_new_Octagonal_Shape_float_from_Int8_Box_with_complexity, 367
ppl_new_Octagonal_Shape_float_from_NNC_Polyhedron, 369
ppl_new_Octagonal_Shape_float_from_NNC_Polyhedron_with_complexity, 368
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpz_class, 370
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpz_class_with_complexity, 368
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_float, 370
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_float_with_complexity, 368
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_double, 370
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_double_with_complexity, 369
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_ld, 371
ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_ld_with_complexity, 368
ppl_new_Octagonal_Shape_float_from_Rational_Box, 370
ppl_new_Octagonal_Shape_float_from_Rational_Box_with_complexity, 368
ppl_new_Octagonal_Shape_float_from_space_dimension, 369
ppl_new_Octagonal_Shape_float_from_Uint16_Box, 367
ppl_new_Octagonal_Shape_float_from_Uint16_Box_with_complexity, 369
ppl_new_Octagonal_Shape_float_from_Uint32_Box, 369
ppl_new_Octagonal_Shape_float_from_Uint32_Box_with_complexity, 371
ppl_new_Octagonal_Shape_float_from_Uint64_Box, 368
ppl_new_Octagonal_Shape_float_from_Uint64_Box_with_complexity, 370
ppl_new_Octagonal_Shape_float_from_Uint8_Box, 368
ppl_new_Octagonal_Shape_float_from_Uint8_Box_with_complexity, 370
ppl_new_Octagonal_Shape_float_from_Z_Box, 370

ppl_new_Octagonal_Shape_float_from_Z_Box_with_complexity, 368
ppl_new_Octagonal_Shape_int16_t_from_Box, 369
ppl_new_Octagonal_Shape_int16_t_from_C_Polyhedron, 146
ppl_new_Octagonal_Shape_int16_t_from_Constraint_System, 148
ppl_new_Octagonal_Shape_int16_t_from_Constraint_System_with_complexity, 148
ppl_new_Octagonal_Shape_int16_t_from_Constraint, 148
ppl_new_Octagonal_Shape_int16_t_from_Generator_System, 146
ppl_new_Octagonal_Shape_int16_t_from_Generator_System_with_complexity, 148
ppl_new_Octagonal_Shape_int16_t_from_Generator, 146
ppl_new_Octagonal_Shape_int16_t_from_Grid, 146
ppl_new_Octagonal_Shape_int16_t_from_Grid_with_complexity, 148
ppl_new_Octagonal_Shape_int16_t_from_Int16_Box, 146
ppl_new_Octagonal_Shape_int16_t_from_Int16_Box_with_complexity, 148
ppl_new_Octagonal_Shape_int16_t_from_Int32_Box, 145
ppl_new_Octagonal_Shape_int16_t_from_Int32_Box_with_complexity, 147
ppl_new_Octagonal_Shape_int16_t_from_Int64_Box, 145
ppl_new_Octagonal_Shape_int16_t_from_Int64_Box_with_complexity, 147
ppl_new_Octagonal_Shape_int16_t_from_Int8_Box, 145
ppl_new_Octagonal_Shape_int16_t_from_Int8_Box_with_complexity, 147
ppl_new_Octagonal_Shape_int16_t_from_Long_Double_Box, 145
ppl_new_Octagonal_Shape_int16_t_from_Long_Double_Box_with_complexity, 147
ppl_new_Octagonal_Shape_int16_t_from_NNC_Polyhedron, 146
ppl_new_Octagonal_Shape_int16_t_from_NNC_Polyhedron_with_complexity, 148
ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape, 145
ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_with_complexity, 147
ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape, 145
ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_with_complexity, 147
ppl_new_Octagonal_Shape_int16_t_from_PPL_Polyhedron, 146
ppl_new_Octagonal_Shape_int16_t_from_PPL_Polyhedron_with_complexity, 148
ppl_new_Octagonal_Shape_int16_t_from_new_Octagonal_Shape_int16_t_from_Octagonal_Shape, 148
ppl_new_Octagonal_Shape_int16_t_from_new_Octagonal_Shape_int16_t_from_Octagonal_Shape, 148
ppl_new_Octagonal_Shape_int16_t_from_new_Octagonal_Shape_int16_t_from_Octagonal_Shape, 146
ppl_new_Octagonal_Shape_int16_t_from_new_Octagonal_Shape_int16_t_from_Octagonal_Shape, 148
ppl_new_Octagonal_Shape_int16_t_from_new_Octagonal_Shape_int16_t_from_Octagonal_Shape, 146
ppl_new_Octagonal_Shape_int16_t_from_new_Octagonal_Shape_int16_t_from_Octagonal_Shape, 148

ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int16_t, 147
ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int32_t, 146
ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int64_t, 148
ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int8_t, 146
ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_mpq_class, 147
ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_mpz_class, 146
ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_uint16_t, 147
ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_uint32_t, 145
ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_uint64_t, 147
ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_uint8_t, 145
ppl_new_Octagonal_Shape_int16_t_from_C_Polyhedron, 145
ppl_new_Octagonal_Shape_int16_t_from_C_Polyhedron_with_complexity, 146
ppl_new_Octagonal_Shape_int16_t_from_congruences, 145
ppl_new_Octagonal_Shape_int16_t_from_constraints, 147
ppl_new_Octagonal_Shape_int16_t_from_Double_Box, 145
ppl_new_Octagonal_Shape_int16_t_from_Double_Box_with_complexity, 147
ppl_new_Octagonal_Shape_int16_t_from_Float_Box, 145
ppl_new_Octagonal_Shape_int16_t_from_Float_Box_with_complexity, 146
ppl_new_Octagonal_Shape_int16_t_from_generators, 145
ppl_new_Octagonal_Shape_int16_t_from_Grid, 147
ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int16_t, 155
ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int32_t, 157
ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int64_t, 154
ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int8_t, 156
ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_mpq_class, 154
ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_mpz_class, 156
ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_uint16_t, 154
ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_uint32_t, 156
ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_uint64_t, 154
ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_uint8_t, 156
ppl_new_Octagonal_Shape_int32_t_from_C_Polyhedron, 154
ppl_new_Octagonal_Shape_int32_t_from_C_Polyhedron_with_complexity, 156
ppl_new_Octagonal_Shape_int32_t_from_congruences, 157
ppl_new_Octagonal_Shape_int32_t_from_constraints, 157
ppl_new_Octagonal_Shape_int32_t_from_Double_Box, 155
ppl_new_Octagonal_Shape_int32_t_from_Double_Box_with_complexity, 157
ppl_new_Octagonal_Shape_int32_t_from_Float_Box, 154
ppl_new_Octagonal_Shape_int32_t_from_Float_Box_with_complexity, 156
ppl_new_Octagonal_Shape_int32_t_from_generators, 157
ppl_new_Octagonal_Shape_int32_t_from_Grid, 154
ppl_new_Octagonal_Shape_int32_t_from_Grid_with_complexity, 156
ppl_new_Octagonal_Shape_int32_t_from_Int16_Box, 153
ppl_new_Octagonal_Shape_int32_t_from_Int16_Box_with_complexity, 155
ppl_new_Octagonal_Shape_int32_t_from_Int32_Box, 153
ppl_new_Octagonal_Shape_int32_t_from_Int32_Box_with_complexity, 155
ppl_new_Octagonal_Shape_int32_t_from_Int64_Box, 154
ppl_new_Octagonal_Shape_int32_t_from_Int64_Box_with_complexity, 156
ppl_new_Octagonal_Shape_int32_t_from_Int8_Box, 154
ppl_new_Octagonal_Shape_int32_t_from_Int8_Box_with_complexity, 156
ppl_new_Octagonal_Shape_int32_t_from_MIP_Problem, 157
ppl_new_Octagonal_Shape_int32_t_from_NNC_Polyhedron, 154
ppl_new_Octagonal_Shape_int32_t_from_NNC_Polyhedron_with_complexity, 156
ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int16_t, 154
ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int32_t, 156
ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int64_t, 154
ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int8_t, 156
ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_mpq_class, 154
ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_mpz_class, 156
ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_uint16_t, 154
ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_uint32_t, 156
ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_uint64_t, 154
ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_uint8_t, 156
ppl_new_Octagonal_Shape_int32_t_from_Polyhedron, 154
ppl_new_Octagonal_Shape_int32_t_from_Polyhedron_with_complexity, 156
ppl_new_Octagonal_Shape_int32_t_from_Rational_Box, 157
ppl_new_Octagonal_Shape_int32_t_from_Rational_Box_with_complexity, 154
ppl_new_Octagonal_Shape_int32_t_from_space_dimension, 156
ppl_new_Octagonal_Shape_int32_t_from_uint16_Box, 154
ppl_new_Octagonal_Shape_int32_t_from_uint16_Box_with_complexity, 156
ppl_new_Octagonal_Shape_int32_t_from_uint32_Box, 154
ppl_new_Octagonal_Shape_int32_t_from_uint32_Box_with_complexity, 156
ppl_new_Octagonal_Shape_int32_t_from_uint64_Box, 157
ppl_new_Octagonal_Shape_int32_t_from_uint64_Box_with_complexity, 157
ppl_new_Octagonal_Shape_int32_t_from_uint8_Box, 157
ppl_new_Octagonal_Shape_int32_t_from_uint8_Box_with_complexity, 155
ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int16_t, 157
ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int32_t, 155
ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int64_t, 157
ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int8_t, 155
ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpq_class, 157
ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpz_class, 155
ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_uint16_t, 157
ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_uint32_t, 155
ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_uint64_t, 157
ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_uint8_t, 155
ppl_new_Octagonal_Shape_int64_t_from_C_Polyhedron, 157
ppl_new_Octagonal_Shape_int64_t_from_C_Polyhedron_with_complexity, 155
ppl_new_Octagonal_Shape_int64_t_from_congruences, 158
ppl_new_Octagonal_Shape_int64_t_from_constraints, 158
ppl_new_Octagonal_Shape_int64_t_from_Double_Box, 156
ppl_new_Octagonal_Shape_int64_t_from_Double_Box_with_complexity, 158
ppl_new_Octagonal_Shape_int64_t_from_Float_Box, 155
ppl_new_Octagonal_Shape_int64_t_from_Float_Box_with_complexity, 157
ppl_new_Octagonal_Shape_int64_t_from_generators, 158
ppl_new_Octagonal_Shape_int64_t_from_Grid, 155
ppl_new_Octagonal_Shape_int64_t_from_Grid_with_complexity, 157
ppl_new_Octagonal_Shape_int64_t_from_Int16_Box, 154
ppl_new_Octagonal_Shape_int64_t_from_Int16_Box_with_complexity, 156
ppl_new_Octagonal_Shape_int64_t_from_Int32_Box, 154
ppl_new_Octagonal_Shape_int64_t_from_Int32_Box_with_complexity, 156
ppl_new_Octagonal_Shape_int64_t_from_Int64_Box, 155
ppl_new_Octagonal_Shape_int64_t_from_Int64_Box_with_complexity, 157
ppl_new_Octagonal_Shape_int64_t_from_Int8_Box, 155
ppl_new_Octagonal_Shape_int64_t_from_Int8_Box_with_complexity, 157
ppl_new_Octagonal_Shape_int64_t_from_MIP_Problem, 158
ppl_new_Octagonal_Shape_int64_t_from_NNC_Polyhedron, 155
ppl_new_Octagonal_Shape_int64_t_from_NNC_Polyhedron_with_complexity, 157
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int16_t, 155
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int32_t, 157
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int64_t, 155
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int8_t, 157
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_mpq_class, 155
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_mpz_class, 157
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_uint16_t, 155
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_uint32_t, 157
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_uint64_t, 155
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_uint8_t, 157
ppl_new_Octagonal_Shape_int64_t_from_Polyhedron, 155
ppl_new_Octagonal_Shape_int64_t_from_Polyhedron_with_complexity, 157
ppl_new_Octagonal_Shape_int64_t_from_Rational_Box, 158
ppl_new_Octagonal_Shape_int64_t_from_Rational_Box_with_complexity, 155
ppl_new_Octagonal_Shape_int64_t_from_space_dimension, 157
ppl_new_Octagonal_Shape_int64_t_from_uint16_Box, 155
ppl_new_Octagonal_Shape_int64_t_from_uint16_Box_with_complexity, 157
ppl_new_Octagonal_Shape_int64_t_from_uint32_Box, 155
ppl_new_Octagonal_Shape_int64_t_from_uint32_Box_with_complexity, 157
ppl_new_Octagonal_Shape_int64_t_from_uint64_Box, 158
ppl_new_Octagonal_Shape_int64_t_from_uint64_Box_with_complexity, 158
ppl_new_Octagonal_Shape_int64_t_from_uint8_Box, 158
ppl_new_Octagonal_Shape_int64_t_from_uint8_Box_with_complexity, 156
ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int16_t, 147
ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int32_t, 146
ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int64_t, 148
ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int8_t, 146
ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_mpq_class, 147
ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_mpz_class, 146
ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_uint16_t, 147
ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_uint32_t, 145
ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_uint64_t, 147
ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_uint8_t, 145
ppl_new_Octagonal_Shape_int8_t_from_C_Polyhedron, 145
ppl_new_Octagonal_Shape_int8_t_from_C_Polyhedron_with_complexity, 146
ppl_new_Octagonal_Shape_int8_t_from_congruences, 145
ppl_new_Octagonal_Shape_int8_t_from_constraints, 147
ppl_new_Octagonal_Shape_int8_t_from_Double_Box, 145
ppl_new_Octagonal_Shape_int8_t_from_Double_Box_with_complexity, 147
ppl_new_Octagonal_Shape_int8_t_from_Float_Box, 145
ppl_new_Octagonal_Shape_int8_t_from_Float_Box_with_complexity, 146
ppl_new_Octagonal_Shape_int8_t_from_generators, 145
ppl_new_Octagonal_Shape_int8_t_from_Grid, 147
ppl_new_Octagonal_Shape_int8_t_from_Int16_Box, 145
ppl_new_Octagonal_Shape_int8_t_from_Int16_Box_with_complexity, 147
ppl_new_Octagonal_Shape_int8_t_from_Int32_Box, 145
ppl_new_Octagonal_Shape_int8_t_from_Int32_Box_with_complexity, 147
ppl_new_Octagonal_Shape_int8_t_from_Int64_Box, 145
ppl_new_Octagonal_Shape_int8_t_from_Int64_Box_with_complexity, 147
ppl_new_Octagonal_Shape_int8_t_from_Int8_Box, 145
ppl_new_Octagonal_Shape_int8_t_from_Int8_Box_with_complexity, 147
ppl_new_Octagonal_Shape_int8_t_from_MIP_Problem, 148
ppl_new_Octagonal_Shape_int8_t_from_NNC_Polyhedron, 145
ppl_new_Octagonal_Shape_int8_t_from_NNC_Polyhedron_with_complexity, 147
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int16_t, 145
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int32_t, 147
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int64_t, 145
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int8_t, 147
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_mpq_class, 145
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_mpz_class, 147
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_uint16_t, 145
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_uint32_t, 147
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_uint64_t, 145
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_uint8_t, 147
ppl_new_Octagonal_Shape_int8_t_from_Polyhedron, 145
ppl_new_Octagonal_Shape_int8_t_from_Polyhedron_with_complexity, 147
ppl_new_Octagonal_Shape_int8_t_from_Rational_Box, 148
ppl_new_Octagonal_Shape_int8_t_from_Rational_Box_with_complexity, 145
ppl_new_Octagonal_Shape_int8_t_from_space_dimension, 147
ppl_new_Octagonal_Shape_int8_t_from_uint16_Box, 145
ppl_new_Octagonal_Shape_int8_t_from_uint16_Box_with_complexity, 147
ppl_new_Octagonal_Shape_int8_t_from_uint32_Box, 145
ppl_new_Octagonal_Shape_int8_t_from_uint32_Box_with_complexity, 147
ppl_new_Octagonal_Shape_int8_t_from_uint64_Box, 148
ppl_new_Octagonal_Shape_int8_t_from_uint64_Box_with_complexity, 148
ppl_new_Octagonal_Shape_int8_t_from_uint8_Box, 148
ppl_new_Octagonal_Shape_int8_t_from_uint8_Box_with_complexity, 146
ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int16_t, 147
ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int32_t, 146
ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int64_t, 148
ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int8_t, 146
ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_mpq_class, 147
ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_mpz_class, 146
ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_uint16_t, 147
ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_uint32_t, 145
ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_uint64_t, 147
ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_uint8_t, 145
ppl_new_Octagonal_Shape_mpq_class_from_C_Polyhedron, 145
ppl_new_Octagonal_Shape_mpq_class_from_C_Polyhedron_with_complexity, 146
ppl_new_Octagonal_Shape_mpq_class_from_congruences, 145
ppl_new_Octagonal_Shape_mpq_class_from_constraints, 147
ppl_new_Octagonal_Shape_mpq_class_from_Double_Box, 145
ppl_new_Octagonal_Shape_mpq_class_from_Double_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpq_class_from_Float_Box, 145
ppl_new_Octagonal_Shape_mpq_class_from_Float_Box_with_complexity, 146
ppl_new_Octagonal_Shape_mpq_class_from_generators, 145
ppl_new_Octagonal_Shape_mpq_class_from_Grid, 147
ppl_new_Octagonal_Shape_mpq_class_from_Grid_with_complexity, 146
ppl_new_Octagonal_Shape_mpq_class_from_Int16_Box, 145
ppl_new_Octagonal_Shape_mpq_class_from_Int16_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpq_class_from_Int32_Box, 145
ppl_new_Octagonal_Shape_mpq_class_from_Int32_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpq_class_from_Int64_Box, 145
ppl_new_Octagonal_Shape_mpq_class_from_Int64_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpq_class_from_Int8_Box, 145
ppl_new_Octagonal_Shape_mpq_class_from_Int8_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpq_class_from_MIP_Problem, 148
ppl_new_Octagonal_Shape_mpq_class_from_NNC_Polyhedron, 145
ppl_new_Octagonal_Shape_mpq_class_from_NNC_Polyhedron_with_complexity, 147
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int16_t, 145
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int32_t, 147
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int64_t, 145
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int8_t, 147
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpq_class, 145
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpz_class, 147
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_uint16_t, 145
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_uint32_t, 147
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_uint64_t, 145
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_uint8_t, 147
ppl_new_Octagonal_Shape_mpq_class_from_Polyhedron, 145
ppl_new_Octagonal_Shape_mpq_class_from_Polyhedron_with_complexity, 147
ppl_new_Octagonal_Shape_mpq_class_from_Rational_Box, 148
ppl_new_Octagonal_Shape_mpq_class_from_Rational_Box_with_complexity, 145
ppl_new_Octagonal_Shape_mpq_class_from_space_dimension, 147
ppl_new_Octagonal_Shape_mpq_class_from_uint16_Box, 145
ppl_new_Octagonal_Shape_mpq_class_from_uint16_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpq_class_from_uint32_Box, 145
ppl_new_Octagonal_Shape_mpq_class_from_uint32_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpq_class_from_uint64_Box, 148
ppl_new_Octagonal_Shape_mpq_class_from_uint64_Box_with_complexity, 148
ppl_new_Octagonal_Shape_mpq_class_from_uint8_Box, 148
ppl_new_Octagonal_Shape_mpq_class_from_uint8_Box_with_complexity, 146
ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int16_t, 147
ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int32_t, 146
ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int64_t, 148
ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int8_t, 146
ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_mpq_class, 147
ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_mpz_class, 146
ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_uint16_t, 147
ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_uint32_t, 145
ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_uint64_t, 147
ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_uint8_t, 145
ppl_new_Octagonal_Shape_mpz_class_from_C_Polyhedron, 145
ppl_new_Octagonal_Shape_mpz_class_from_C_Polyhedron_with_complexity, 146
ppl_new_Octagonal_Shape_mpz_class_from_congruences, 145
ppl_new_Octagonal_Shape_mpz_class_from_constraints, 147
ppl_new_Octagonal_Shape_mpz_class_from_Double_Box, 145
ppl_new_Octagonal_Shape_mpz_class_from_Double_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpz_class_from_Float_Box, 145
ppl_new_Octagonal_Shape_mpz_class_from_Float_Box_with_complexity, 146
ppl_new_Octagonal_Shape_mpz_class_from_generators, 145
ppl_new_Octagonal_Shape_mpz_class_from_Grid, 147
ppl_new_Octagonal_Shape_mpz_class_from_Grid_with_complexity, 146
ppl_new_Octagonal_Shape_mpz_class_from_Int16_Box, 145
ppl_new_Octagonal_Shape_mpz_class_from_Int16_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpz_class_from_Int32_Box, 145
ppl_new_Octagonal_Shape_mpz_class_from_Int32_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpz_class_from_Int64_Box, 145
ppl_new_Octagonal_Shape_mpz_class_from_Int64_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpz_class_from_Int8_Box, 145
ppl_new_Octagonal_Shape_mpz_class_from_Int8_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpz_class_from_MIP_Problem, 148
ppl_new_Octagonal_Shape_mpz_class_from_NNC_Polyhedron, 145
ppl_new_Octagonal_Shape_mpz_class_from_NNC_Polyhedron_with_complexity, 147
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int16_t, 145
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int32_t, 147
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int64_t, 145
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int8_t, 147
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpq_class, 145
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class, 147
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_uint16_t, 145
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_uint32_t, 147
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_uint64_t, 145
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_uint8_t, 147
ppl_new_Octagonal_Shape_mpz_class_from_Polyhedron, 145
ppl_new_Octagonal_Shape_mpz_class_from_Polyhedron_with_complexity, 147
ppl_new_Octagonal_Shape_mpz_class_from_Rational_Box, 148
ppl_new_Octagonal_Shape_mpz_class_from_Rational_Box_with_complexity, 145
ppl_new_Octagonal_Shape_mpz_class_from_space_dimension, 147
ppl_new_Octagonal_Shape_mpz_class_from_uint16_Box, 145
ppl_new_Octagonal_Shape_mpz_class_from_uint16_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpz_class_from_uint32_Box, 145
ppl_new_Octagonal_Shape_mpz_class_from_uint32_Box_with_complexity, 147
ppl_new_Octagonal_Shape_mpz_class_from_uint64_Box, 148
ppl_new_Octagonal_Shape_mpz_class_from_uint64_Box_with_complexity, 148
ppl_new_Octagonal_Shape_mpz_class_from_uint8_Box, 148
ppl_new_Octagonal_Shape_mpz_class_from_uint8_Box_with_complexity, 146
ppl_new_Octagonal_Shape_uint16_t_from_BD_Shape_int16_t, 147
ppl_new_Octagonal_Shape_uint16_t_from_BD_Shape_int32_t, 146
ppl_new_Octagonal_Shape_uint16_t_from_BD_Shape_int64_t, 148
ppl_new_Octagonal_Shape_uint16_t_from_BD_Shape_int8_t, 146
ppl_new_Octagonal_Shape_uint16_t_from_BD_Shape_mpq_class, 147
ppl_new_Octagonal_Shape_uint16_t_from_BD_Shape_mpz_class, 146
ppl_new_Octagonal_Shape_uint16_t_from_BD_Shape_uint16_t, 147
ppl_new_Octagonal_Shape_uint16_t_from_BD_Shape_uint32_t, 145
ppl_new_Octagonal_Shape_uint16_t_from_BD_Shape_uint64_t, 147
ppl_new_Octagonal_Shape_uint16_t_from_BD_Shape_uint8_t, 145
ppl_new_Octagonal_Shape_uint16_t_from_C_Polyhedron, 145
ppl_new_Octagonal_Shape_uint16_t_from_C_Polyhedron_with_complexity, 146
ppl_new_Octagonal_Shape_uint16_t_from_congruences, 145
ppl_new_Octagonal_Shape_uint16_t_from_constraints, 147
ppl_new_Octagonal_Shape_uint16_t_from_Double_Box, 145
ppl_new_Octagonal_Shape_uint16_t_from_Double_Box_with_complexity, 147
ppl_new_Octagonal_Shape_uint16_t_from_Float_Box, 145
ppl_new_Octagonal_Shape_uint16_t_from_Float_Box_with_complexity, 146
ppl_new_Octagonal_Shape_uint16_t_from_generators, 145
ppl_new_Octagonal_Shape_uint16_t_from_Grid, 147
ppl_new_Octagonal_Shape_uint16_t_from_Int16_Box, 145
ppl_new_Octagonal_Shape_uint16_t_from_Int16_Box_with_complexity, 147
ppl_new_Octagonal_Shape_uint16_t_from_Int32_Box, 145
ppl_new_Octagonal_Shape_uint16_t_from_Int32_Box_with_complexity, 147
ppl_new_Octagonal_Shape_uint16_t_from_Int64_Box, 145
ppl_new_Octagonal_Shape_uint16_t_from_Int64_Box_with_complexity, 147
ppl_new_Octagonal_Shape_uint16_t_from_Int8_Box, 145
ppl_new_Octagonal_Shape_uint16_t_from_Int8_Box_with_complexity, 147
ppl_new_Octagonal_Shape_uint16_t_from_MIP_Problem, 148
ppl_new_Octagonal_Shape_uint16_t_from_NNC_Polyhedron, 145
ppl_new_Octagonal_Shape_uint16_t_from_NNC_Polyhedron_with_complexity, 147
ppl_new_Octagonal_Shape_uint16_t_from_Octagonal_Shape_int16_t, 145
ppl_new_Octagonal_Shape_uint16_t_from_Octagonal_Shape_int32_t, 147
ppl_new_Octagonal_Shape_uint16_t_from_Octagonal_Shape_int64_t, 145
ppl_new_Octagonal_Shape_uint16_t_from_Octagonal_Shape_int8_t, 147
ppl_new_Octagonal_Shape_uint16_t_from_Octagonal_Shape_mpq_class, 145
ppl_new_Octagonal_Shape_uint16_t_from_Octagonal_Shape_mpz_class, 147
ppl_new_Octagonal_Shape_uint16_t_from_Octagonal_Shape_uint16_t, 145
ppl_new_Octagonal_Shape_uint16_t_from_Octagonal_Shape_uint32_t, 147
ppl_new_Octagonal_Shape_uint16_t_from_Octagonal_Shape_uint64_t, 145
ppl_new_Octagonal_Shape_uint16_t_from_Octagonal_Shape_uint8_t, 147
ppl_new_Octagonal_Shape_uint16_t_from_Polyhedron, 145
ppl_new_Octagonal_Shape_uint16_t_from_Polyhedron_with_complexity, 147
ppl_new_Octagonal_Shape_uint16_t_from_Rational_Box, 148
ppl_new_Octagonal_Shape_uint16_t_from_Rational_Box_with_complexity, 145
ppl_new_Octagonal_Shape_uint16_t_from_space_dimension, 147
ppl_new_Octagonal_Shape_uint16_t_from_uint16_Box, 145
ppl_new_Octagonal_Shape_uint16_t_from_uint16_Box_with_complexity, 147
ppl_new_Octagonal_Shape_uint16_t_from_uint32_Box, 145
ppl_new_Octagonal_Shape_uint16_t_from_uint32_Box_with_complexity, 147
ppl_new_Octagonal_Shape_uint16_t_from_uint64_Box, 148
ppl_new_Octagonal_Shape_uint16_t_from_uint64_Box_with_complexity, 148
ppl_new_Octagonal_Shape_uint16_t_from_uint8_Box, 148
ppl_new_Octagonal_Shape_uint16_t_from_uint8_Box_with_complexity, 146
ppl_new_Octagonal_Shape_uint32_t_from_BD_Shape_int16_t, 155
ppl_new_Octagonal_Shape_uint32_t_from_BD_Shape_int32_t, 157
ppl_new_Octagonal_Shape_uint32_t_from_BD_Shape_int64_t, 154
ppl_new_Octagonal_Shape_uint32_t_from_BD_Shape_int8_t, 156
ppl_new_Octagonal_Shape_uint32_t_from_BD_Shape_mpq_class, 154
ppl_new_Octagonal_Shape_uint32_t_from_BD_Shape_mpz_class, 156
ppl_new_Octagonal_Shape_uint32_t_from_BD_Shape_uint16_t, 154
ppl_new_Octagonal_Shape_uint32_t_from_BD_Shape_uint32_t, 156
ppl_new_Octagonal_Shape_uint32_t_from_BD_Shape_uint64_t, 154
ppl_new_Octagonal_Shape_uint32_t_from_BD_Shape_uint8_t, 156
ppl_new_Octagonal_Shape_uint32_t_from_C_Polyhedron, 154
ppl_new_Octagonal_Shape_uint32_t_from_C_Polyhedron_with_complexity, 156
ppl_new_Octagonal_Shape_uint32_t_from_congruences, 157
ppl_new_Octagonal_Shape_uint32_t_from_constraints, 157
ppl_new_Octagonal_Shape_uint32_t_from_Double_Box, 155
ppl_new_Octagonal_Shape_uint32_t_from_Double_Box_with_complexity, 157
ppl_new_Octagonal_Shape_uint32_t_from_Float_Box, 154
ppl_new_Octagonal_Shape_uint32_t_from_Float_Box_with_complexity, 156
ppl_new_Octagonal_Shape_uint32_t_from_generators, 157
ppl_new_Octagonal_Shape_uint32_t_from_Grid, 154
ppl_new_Octagonal_Shape_uint32_t_from_Grid_with_complexity, 156
ppl_new_Octagonal_Shape_uint32_t_from_Int16_Box, 153
ppl_new_Octagonal_Shape_uint32_t_from_Int16_Box_with_complexity, 155
ppl_new_Octagonal_Shape_uint32_t_from_Int32_Box, 153
ppl_new_Octagonal_Shape_uint32_t_from_Int32_Box_with_complexity, 155
ppl_new_Octagonal_Shape_uint32_t_from_Int64_Box, 154
ppl_new_Octagonal_Shape_uint32_t_from_Int64_Box_with_complexity, 156
ppl_new_Octagonal_Shape_uint32_t_from_Int8_Box, 154
ppl_new_Octagonal_Shape_uint32_t_from_Int8_Box_with_complexity, 156
ppl_new_Octagonal_Shape_uint32_t_from_MIP_Problem, 157
ppl_new_Octagonal_Shape_uint32_t_from_NNC_Polyhedron, 154
ppl_new_Octagonal_Shape_uint32_t_from_NNC_Polyhedron_with_complexity, 156
ppl_new_Octagonal_Shape_uint32_t_from_Octagonal_Shape_int16_t, 154
ppl_new_Octagonal_Shape_uint32_t_from_Octagonal_Shape_int32_t, 156
ppl_new_Octagonal_Shape_uint32_t_from_Octagonal_Shape_int64_t, 154
ppl_new_Octagonal_Shape_uint32_t_from_Octagonal_Shape_int8_t, 156
ppl_new_Octagonal_Shape_uint32_t_from_Octagonal_Shape_mpq_class, 154
ppl_new_Octagonal_Shape_uint32_t_from_Octagonal_Shape_mpz_class, 156
ppl_new_Octagonal_Shape_uint32_t_from_Octagonal_Shape_uint16_t, 154
ppl_new_Octagonal_Shape_uint32_t_from_Octagonal_Shape_uint32_t, 156
ppl_new_Octagonal_Shape_uint32_t_from_Octagonal_Shape_uint64_t, 154
ppl_new_Octagonal_Shape_uint32_t_from_Octagonal_Shape_uint8_t, 156
ppl_new_Octagonal_Shape_uint32_t_from_Polyhedron, 154
ppl_new_Octagonal_Shape_uint32_t_from_Polyhedron_with_complexity, 156
ppl_new_Octagonal_Shape_uint32_t_from_Rational_Box, 157
ppl_new_Octagonal_Shape_uint32_t_from_Rational_Box_with_complexity, 154
ppl_new_Octagonal_Shape_uint32_t_from_space_dimension, 156
ppl_new_Octagonal_Shape_uint32_t_from_uint16_Box, 154
ppl_new_Octagonal_Shape_uint32_t_from_uint16_Box_with_complexity, 156
ppl_new_Octagonal_Shape_uint32_t_from_uint32_Box, 154
ppl_new_Octagonal_Shape_uint32_t_from_uint32_Box_with_complexity, 156
ppl_new_Octagonal_Shape_uint32_t_from_uint64_Box, 157
ppl_new_Octagonal_Shape_uint32_t_from_uint64_Box_with_complexity, 157
ppl_new_Octagonal_Shape_uint32_t_from_uint8_Box, 157
ppl_new_Octagonal_Shape_uint32_t_from_uint8_Box_with_complexity, 155
ppl_new_Octagonal_Shape_uint64_t_from_BD_Shape_int16_t, 157
ppl_new_Octagonal_Shape_uint64_t_from_BD_Shape_int32_t, 155
ppl_new_Octagonal_Shape_uint64_t_from_BD_Shape_int64_t, 157
ppl_new_Octagonal_Shape_uint64_t_from_BD_Shape_int8_t, 155
ppl_new_Octagonal_Shape_uint64_t_from_BD_Shape_mpq_class, 157
ppl_new_Octagonal_Shape_uint64_t_from_BD_Shape_mpz_class, 155
ppl_new_Octagonal_Shape_uint64_t_from_BD_Shape_uint16_t, 157
ppl_new_Octagonal_Shape_uint64_t_from_BD_Shape_uint32_t, 155
ppl_new_Octagonal_Shape_uint64_t_from_BD_Shape_uint64_t, 157
ppl_new_Octagonal_Shape_uint64_t_from_BD_Shape_uint8_t, 155
ppl_new_Octagonal_Shape_uint64_t_from_C_Polyhedron, 157
ppl_new_Octagonal_Shape_uint64_t_from_C_Polyhedron_with_complexity, 155
ppl_new_Octagonal_Shape_uint64_t_from_congruences, 158
ppl_new_Octagonal_Shape_uint64_t_from_constraints, 158
ppl_new_Octagonal_Shape_uint64_t_from_Double_Box, 156
ppl_new_Octagonal_Shape_uint64_t_from_Double_Box_with_complexity, 158
ppl_new_Octagonal_Shape_uint64_t_from_Float_Box, 155
ppl_new_Octagonal_Shape_uint64_t_from_Float_Box_with_complexity, 157
ppl_new_Octagonal_Shape_uint64_t_from_generators, 158
ppl_new_Octagonal_Shape_uint64_t_from_Grid, 155
ppl_new_Octagonal_Shape_uint64_t_from_Grid_with_complexity, 157
ppl_new_Octagonal_Shape_uint64_t_from

155 153
ppl_new_Octagonal_Shape_int32_t_from_Int8_Box, ppl_new_Octagonal_Shape_int32_t_from_Uint16_Box,
153 154
ppl_new_Octagonal_Shape_int32_t_from_Int8_Box_with_complexity, ppl_new_Octagonal_Shape_int32_t_from_Uint16_Box_w
155 155
ppl_new_Octagonal_Shape_int32_t_from_Int32_Box, ppl_new_Octagonal_Shape_int32_t_from_Uint32_Box,
155 154
ppl_new_Octagonal_Shape_int32_t_from_Int32_Box_with_complexity, ppl_new_Octagonal_Shape_int32_t_from_Uint32_Box_w
157 155
ppl_new_Octagonal_Shape_int32_t_from_NNC_Polyhedron, ppl_new_Octagonal_Shape_int32_t_from_Uint64_Box,
154 154
ppl_new_Octagonal_Shape_int32_t_from_NNC_Polyhedron_with_complexity, ppl_new_Octagonal_Shape_int32_t_from_Uint64_Box_w
156 155
ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape, ppl_new_Octagonal_Shape_int32_t_from_Uint8_Box,
155 154
ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_with_complexity, ppl_new_Octagonal_Shape_int32_t_from_Uint8_Box_wi
157 155
ppl_new_Octagonal_Shape_int32_t_from_Polyhedron, ppl_new_Octagonal_Shape_int32_t_from_Z_Box,
155 154
ppl_new_Octagonal_Shape_int32_t_from_Polyhedron_with_complexity, ppl_new_Octagonal_Shape_int32_t_from_Z_Box_with_c
156 155
ppl_new_Octagonal_Shape_int64_t_from_BD_Shape, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_dou
154 163
ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_with_complexity, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_dou
156 165
ppl_new_Octagonal_Shape_int64_t_from_Box, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_flo
154 163
ppl_new_Octagonal_Shape_int64_t_from_Box_with_complexity, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_flo
156 165
ppl_new_Octagonal_Shape_int64_t_from_Grid, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int
154 163
ppl_new_Octagonal_Shape_int64_t_from_Grid_with_complexity, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int
156 164
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int
154 163
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_with_complexity, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int
156 164
ppl_new_Octagonal_Shape_int64_t_from_Polyhedron, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int
155 163
ppl_new_Octagonal_Shape_int64_t_from_Polyhedron_with_complexity, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int
157 164
ppl_new_Octagonal_Shape_int64_t_from_Pottier_Simplex, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int
154 162
ppl_new_Octagonal_Shape_int64_t_from_Pottier_Simplex_with_complexity, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int
156 164
ppl_new_Octagonal_Shape_int64_t_from_Pottier_Simplex, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_lon
154 163
ppl_new_Octagonal_Shape_int64_t_from_Pottier_Simplex_with_complexity, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_lon
156 165
ppl_new_Octagonal_Shape_int64_t_from_Pottier_Simplex, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpq
154 163
ppl_new_Octagonal_Shape_int64_t_from_Pottier_Simplex_with_complexity, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpq
155 164
ppl_new_Octagonal_Shape_int64_t_from_space_dimension, ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpz

ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpz_class, 163
ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpz_class_with_complexity, 163
ppl_new_Octagonal_Shape_int64_t_from_C_Polyhedron, 164
ppl_new_Octagonal_Shape_int64_t_from_C_Polyhedron_with_complexity, 163
ppl_new_Octagonal_Shape_int64_t_from_Constraint_System, 165
ppl_new_Octagonal_Shape_int64_t_from_Constraint_System_with_complexity, 163
ppl_new_Octagonal_Shape_int64_t_from_Generator_System, 166
ppl_new_Octagonal_Shape_int64_t_from_Generator_System_with_complexity, 163
ppl_new_Octagonal_Shape_int64_t_from_Double_Box, 166
ppl_new_Octagonal_Shape_int64_t_from_Double_Box_with_complexity, 163
ppl_new_Octagonal_Shape_int64_t_from_Float_Box, 165
ppl_new_Octagonal_Shape_int64_t_from_Float_Box_with_complexity, 163
ppl_new_Octagonal_Shape_int64_t_from_Grid, 165
ppl_new_Octagonal_Shape_int64_t_from_Grid_with_complexity, 163
ppl_new_Octagonal_Shape_int64_t_from_Int16_Box, 165
ppl_new_Octagonal_Shape_int64_t_from_Int16_Box_with_complexity, 162
ppl_new_Octagonal_Shape_int64_t_from_Int32_Box, 164
ppl_new_Octagonal_Shape_int64_t_from_Int32_Box_with_complexity, 162
ppl_new_Octagonal_Shape_int64_t_from_Int64_Box, 164
ppl_new_Octagonal_Shape_int64_t_from_Int64_Box_with_complexity, 162
ppl_new_Octagonal_Shape_int64_t_from_Int8_Box, 164
ppl_new_Octagonal_Shape_int64_t_from_Int8_Box_with_complexity, 162
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_mpz_class, 164
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_mpz_class_with_complexity, 163
ppl_new_Octagonal_Shape_int64_t_from_Polyhedron, 165
ppl_new_Octagonal_Shape_int64_t_from_Polyhedron_with_complexity, 163
ppl_new_Octagonal_Shape_int64_t_from_Rational_Box, 165
ppl_new_Octagonal_Shape_int64_t_from_Rational_Box_with_complexity, 164
ppl_new_Octagonal_Shape_int64_t_from_space_dimension, 166
ppl_new_Octagonal_Shape_int64_t_from_Uint16_Box, 163
ppl_new_Octagonal_Shape_int64_t_from_Uint16_Box_with_complexity, 163
ppl_new_Octagonal_Shape_int64_t_from_Uint32_Box, 165
ppl_new_Octagonal_Shape_int64_t_from_Uint32_Box_with_complexity, 164
ppl_new_Octagonal_Shape_int64_t_from_Uint64_Box, 163
ppl_new_Octagonal_Shape_int64_t_from_Uint64_Box_with_complexity, 165
ppl_new_Octagonal_Shape_int64_t_from_Uint8_Box, 163
ppl_new_Octagonal_Shape_int64_t_from_Uint8_Box_with_complexity, 165
ppl_new_Octagonal_Shape_int64_t_from_Z_Box, 163
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int64_t, 163
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int64_t_with_complexity, 165
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int8_t, 163
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int8_t_with_complexity, 165
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_uint16_t, 163
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_uint16_t_with_complexity, 165
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_uint32_t, 163
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_uint32_t_with_complexity, 165
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_uint64_t, 163
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_uint64_t_with_complexity, 165
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_uint8_t, 163
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_uint8_t_with_complexity, 165
ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_float, 165

ppl_new_Octagonal_Shape_int64_t_from_PPL_Box, 162
ppl_new_Octagonal_Shape_int64_t_from_PPL_Box_with_complexity, 162
ppl_new_Octagonal_Shape_int64_t_from_PPL_Constraint_System, 164
ppl_new_Octagonal_Shape_int64_t_from_PPL_Grid, 164
ppl_new_Octagonal_Shape_int64_t_from_PPL_Grid_with_complexity, 164
ppl_new_Octagonal_Shape_int8_t_from_Double_Box, 138
ppl_new_Octagonal_Shape_int8_t_from_Double_Box_with_complexity, 138
ppl_new_Octagonal_Shape_int8_t_from_Generator_System, 140
ppl_new_Octagonal_Shape_int8_t_from_Int16_Box, 138
ppl_new_Octagonal_Shape_int8_t_from_Int16_Box_with_complexity, 139
ppl_new_Octagonal_Shape_int8_t_from_Int32_Box, 137
ppl_new_Octagonal_Shape_int8_t_from_Int32_Box_with_complexity, 139
ppl_new_Octagonal_Shape_int8_t_from_Int64_Box, 137
ppl_new_Octagonal_Shape_int8_t_from_Int64_Box_with_complexity, 139
ppl_new_Octagonal_Shape_int8_t_from_Int8_Box, 137
ppl_new_Octagonal_Shape_int8_t_from_Int8_Box_with_complexity, 139
ppl_new_Octagonal_Shape_int8_t_from_Long_Double_Box, 137
ppl_new_Octagonal_Shape_int8_t_from_Long_Double_Box_with_complexity, 139
ppl_new_Octagonal_Shape_int8_t_from_NNC_Polyhedron, 138
ppl_new_Octagonal_Shape_int8_t_from_NNC_Polyhedron_with_complexity, 140
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape, 137
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_with_complexity, 139
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int8_t, 137
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int8_t_with_complexity, 139
ppl_new_Octagonal_Shape_int8_t_from_Polyhedron, 137
ppl_new_Octagonal_Shape_int8_t_from_Polyhedron_with_complexity, 139
ppl_new_Octagonal_Shape_int8_t_from_constraints, 140
ppl_new_Octagonal_Shape_int8_t_from_constraints_with_complexity, 140
ppl_new_Octagonal_Shape_int8_t_from_double_box, 138
ppl_new_Octagonal_Shape_int8_t_from_double_box_with_complexity, 140
ppl_new_Octagonal_Shape_int8_t_from_float_box, 138
ppl_new_Octagonal_Shape_int8_t_from_float_box_with_complexity, 139
ppl_new_Octagonal_Shape_int8_t_from_generators, 140
ppl_new_Octagonal_Shape_int8_t_from_generators_with_complexity, 140
ppl_new_Octagonal_Shape_int8_t_from_grid, 137
ppl_new_Octagonal_Shape_int8_t_from_grid_with_complexity, 139
ppl_new_Octagonal_Shape_int8_t_from_int16_box, 137
ppl_new_Octagonal_Shape_int8_t_from_int16_box_with_complexity, 138
ppl_new_Octagonal_Shape_int8_t_from_int32_box, 137
ppl_new_Octagonal_Shape_int8_t_from_int32_box_with_complexity, 138
ppl_new_Octagonal_Shape_int8_t_from_int64_box, 137
ppl_new_Octagonal_Shape_int8_t_from_int64_box_with_complexity, 138
ppl_new_Octagonal_Shape_int8_t_from_int8_box, 137
ppl_new_Octagonal_Shape_int8_t_from_int8_box_with_complexity, 138
ppl_new_Octagonal_Shape_int8_t_from_long_double_box, 138
ppl_new_Octagonal_Shape_int8_t_from_long_double_box_with_complexity, 139
ppl_new_Octagonal_Shape_int8_t_from_octagonal_shape, 138
ppl_new_Octagonal_Shape_int8_t_from_octagonal_shape_with_complexity, 140
ppl_new_Octagonal_Shape_int8_t_from_octagonal_shape_int8_t, 138
ppl_new_Octagonal_Shape_int8_t_from_octagonal_shape_int8_t_with_complexity, 140

ppl_new_Octagonal_Shape_int8_t_from_Box, 139
ppl_new_Octagonal_Shape_int8_t_from_C_Polyhedron, 138
ppl_new_Octagonal_Shape_int8_t_from_Constraint_System, 140
ppl_new_Octagonal_Shape_int8_t_from_Generator_System, 137
ppl_new_Octagonal_Shape_int8_t_from_Grid, 139
ppl_new_Octagonal_Shape_int8_t_from_NNC_Polyhedron, 137
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_double, 139
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_long_double, 137
ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_mpq_class, 138
ppl_new_Octagonal_Shape_int8_t_from_space_dimension, 136
ppl_new_Octagonal_Shape_int8_t_from_Uint16_t, 137
ppl_new_Octagonal_Shape_int8_t_from_Uint32_t, 138
ppl_new_Octagonal_Shape_int8_t_from_Uint64_t, 137
ppl_new_Octagonal_Shape_int8_t_from_Uint8_t, 138
ppl_new_Octagonal_Shape_int8_t_from_Zero_Dim_Univ, 137
ppl_new_Octagonal_Shape_long_double_from_BD_Shape_double, 443
ppl_new_Octagonal_Shape_long_double_from_BD_Shape_long_double, 445
ppl_new_Octagonal_Shape_long_double_from_BD_Shape_mpq_class, 443
ppl_new_Octagonal_Shape_long_double_from_BD_Shape_Uint16_t, 443
ppl_new_Octagonal_Shape_long_double_from_BD_Shape_Uint32_t, 444
ppl_new_Octagonal_Shape_long_double_from_BD_Shape_Uint64_t, 443
ppl_new_Octagonal_Shape_long_double_from_BD_Shape_Uint8_t, 443
ppl_new_Octagonal_Shape_long_double_from_Box, 445
ppl_new_Octagonal_Shape_long_double_from_C_Polyhedron, 443
ppl_new_Octagonal_Shape_long_double_from_congruences, 446
ppl_new_Octagonal_Shape_long_double_from_constraints, 446
ppl_new_Octagonal_Shape_long_double_from_Double_Box, 443
ppl_new_Octagonal_Shape_long_double_from_Double_Box_with_complexity, 445
ppl_new_Octagonal_Shape_long_double_from_Float_Box, 443
ppl_new_Octagonal_Shape_long_double_from_Float_Box_with_complexity, 445
ppl_new_Octagonal_Shape_long_double_from_generators, 446
ppl_new_Octagonal_Shape_long_double_from_Grid, 443
ppl_new_Octagonal_Shape_long_double_from_Grid_with_complexity, 445
ppl_new_Octagonal_Shape_long_double_from_Int16_Box, 442
ppl_new_Octagonal_Shape_long_double_from_Int16_Box_with_complexity, 444
ppl_new_Octagonal_Shape_long_double_from_Int32_Box, 442
ppl_new_Octagonal_Shape_long_double_from_Int32_Box_with_complexity, 444
ppl_new_Octagonal_Shape_long_double_from_Int64_Box, 442
ppl_new_Octagonal_Shape_long_double_from_Int64_Box_with_complexity, 444
ppl_new_Octagonal_Shape_long_double_from_Int8_Box, 442
ppl_new_Octagonal_Shape_long_double_from_Int8_Box_with_complexity, 444
ppl_new_Octagonal_Shape_long_double_from_NNC_Polyhedron, 443
ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_double, 443
ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_long_double, 445
ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_mpq_class, 443
ppl_new_Octagonal_Shape_long_double_from_space_dimension, 442
ppl_new_Octagonal_Shape_long_double_from_Uint16_t, 443
ppl_new_Octagonal_Shape_long_double_from_Uint32_t, 444
ppl_new_Octagonal_Shape_long_double_from_Uint64_t, 443
ppl_new_Octagonal_Shape_long_double_from_Uint8_t, 443
ppl_new_Octagonal_Shape_long_double_from_Zero_Dim_Univ, 443
ppl_new_Octagonal_Shape_mpq_class_from_Box, 139
ppl_new_Octagonal_Shape_mpq_class_from_C_Polyhedron, 138
ppl_new_Octagonal_Shape_mpq_class_from_congruences, 140
ppl_new_Octagonal_Shape_mpq_class_from_constraints, 137
ppl_new_Octagonal_Shape_mpq_class_from_Double_Box, 139
ppl_new_Octagonal_Shape_mpq_class_from_Double_Box_with_complexity, 137
ppl_new_Octagonal_Shape_mpq_class_from_Float_Box, 139
ppl_new_Octagonal_Shape_mpq_class_from_Float_Box_with_complexity, 137
ppl_new_Octagonal_Shape_mpq_class_from_generators, 138
ppl_new_Octagonal_Shape_mpq_class_from_Grid, 139
ppl_new_Octagonal_Shape_mpq_class_from_Grid_with_complexity, 137
ppl_new_Octagonal_Shape_mpq_class_from_Int16_Box, 139
ppl_new_Octagonal_Shape_mpq_class_from_Int16_Box_with_complexity, 137
ppl_new_Octagonal_Shape_mpq_class_from_Int32_Box, 139
ppl_new_Octagonal_Shape_mpq_class_from_Int32_Box_with_complexity, 137
ppl_new_Octagonal_Shape_mpq_class_from_Int64_Box, 139
ppl_new_Octagonal_Shape_mpq_class_from_Int64_Box_with_complexity, 137
ppl_new_Octagonal_Shape_mpq_class_from_Int8_Box, 139
ppl_new_Octagonal_Shape_mpq_class_from_Int8_Box_with_complexity, 137
ppl_new_Octagonal_Shape_mpq_class_from_NNC_Polyhedron, 138
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_double, 138
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_long_double, 138
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpq_class, 136
ppl_new_Octagonal_Shape_mpq_class_from_space_dimension, 137
ppl_new_Octagonal_Shape_mpq_class_from_Uint16_t, 138
ppl_new_Octagonal_Shape_mpq_class_from_Uint32_t, 137
ppl_new_Octagonal_Shape_mpq_class_from_Uint64_t, 138
ppl_new_Octagonal_Shape_mpq_class_from_Uint8_t, 137
ppl_new_Octagonal_Shape_mpq_class_from_Zero_Dim_Univ, 138
ppl_new_Octagonal_Shape_Uint16_t_from_Box, 444
ppl_new_Octagonal_Shape_Uint16_t_from_C_Polyhedron, 443
ppl_new_Octagonal_Shape_Uint16_t_from_congruences, 445
ppl_new_Octagonal_Shape_Uint16_t_from_constraints, 443
ppl_new_Octagonal_Shape_Uint16_t_from_Double_Box, 443
ppl_new_Octagonal_Shape_Uint16_t_from_Double_Box_with_complexity, 443
ppl_new_Octagonal_Shape_Uint16_t_from_Float_Box, 443
ppl_new_Octagonal_Shape_Uint16_t_from_Float_Box_with_complexity, 443
ppl_new_Octagonal_Shape_Uint16_t_from_generators, 446
ppl_new_Octagonal_Shape_Uint16_t_from_Grid, 443
ppl_new_Octagonal_Shape_Uint16_t_from_Grid_with_complexity, 445
ppl_new_Octagonal_Shape_Uint16_t_from_Int16_Box, 442
ppl_new_Octagonal_Shape_Uint16_t_from_Int16_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint16_t_from_Int32_Box, 442
ppl_new_Octagonal_Shape_Uint16_t_from_Int32_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint16_t_from_Int64_Box, 442
ppl_new_Octagonal_Shape_Uint16_t_from_Int64_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint16_t_from_Int8_Box, 442
ppl_new_Octagonal_Shape_Uint16_t_from_Int8_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint16_t_from_NNC_Polyhedron, 443
ppl_new_Octagonal_Shape_Uint16_t_from_Octagonal_Shape_double, 443
ppl_new_Octagonal_Shape_Uint16_t_from_Octagonal_Shape_long_double, 445
ppl_new_Octagonal_Shape_Uint16_t_from_Octagonal_Shape_mpq_class, 443
ppl_new_Octagonal_Shape_Uint16_t_from_space_dimension, 442
ppl_new_Octagonal_Shape_Uint16_t_from_Uint16_t, 443
ppl_new_Octagonal_Shape_Uint16_t_from_Uint32_t, 444
ppl_new_Octagonal_Shape_Uint16_t_from_Uint64_t, 443
ppl_new_Octagonal_Shape_Uint16_t_from_Uint8_t, 443
ppl_new_Octagonal_Shape_Uint16_t_from_Zero_Dim_Univ, 443
ppl_new_Octagonal_Shape_Uint32_t_from_Box, 445
ppl_new_Octagonal_Shape_Uint32_t_from_C_Polyhedron, 443
ppl_new_Octagonal_Shape_Uint32_t_from_congruences, 446
ppl_new_Octagonal_Shape_Uint32_t_from_constraints, 446
ppl_new_Octagonal_Shape_Uint32_t_from_Double_Box, 443
ppl_new_Octagonal_Shape_Uint32_t_from_Double_Box_with_complexity, 445
ppl_new_Octagonal_Shape_Uint32_t_from_Float_Box, 443
ppl_new_Octagonal_Shape_Uint32_t_from_Float_Box_with_complexity, 445
ppl_new_Octagonal_Shape_Uint32_t_from_generators, 446
ppl_new_Octagonal_Shape_Uint32_t_from_Grid, 443
ppl_new_Octagonal_Shape_Uint32_t_from_Grid_with_complexity, 445
ppl_new_Octagonal_Shape_Uint32_t_from_Int16_Box, 442
ppl_new_Octagonal_Shape_Uint32_t_from_Int16_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint32_t_from_Int32_Box, 442
ppl_new_Octagonal_Shape_Uint32_t_from_Int32_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint32_t_from_Int64_Box, 442
ppl_new_Octagonal_Shape_Uint32_t_from_Int64_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint32_t_from_Int8_Box, 442
ppl_new_Octagonal_Shape_Uint32_t_from_Int8_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint32_t_from_NNC_Polyhedron, 443
ppl_new_Octagonal_Shape_Uint32_t_from_Octagonal_Shape_double, 443
ppl_new_Octagonal_Shape_Uint32_t_from_Octagonal_Shape_long_double, 445
ppl_new_Octagonal_Shape_Uint32_t_from_Octagonal_Shape_mpq_class, 443
ppl_new_Octagonal_Shape_Uint32_t_from_space_dimension, 442
ppl_new_Octagonal_Shape_Uint32_t_from_Uint16_t, 443
ppl_new_Octagonal_Shape_Uint32_t_from_Uint32_t, 444
ppl_new_Octagonal_Shape_Uint32_t_from_Uint64_t, 443
ppl_new_Octagonal_Shape_Uint32_t_from_Uint8_t, 443
ppl_new_Octagonal_Shape_Uint32_t_from_Zero_Dim_Univ, 443
ppl_new_Octagonal_Shape_Uint64_t_from_Box, 446
ppl_new_Octagonal_Shape_Uint64_t_from_C_Polyhedron, 443
ppl_new_Octagonal_Shape_Uint64_t_from_congruences, 446
ppl_new_Octagonal_Shape_Uint64_t_from_constraints, 446
ppl_new_Octagonal_Shape_Uint64_t_from_Double_Box, 443
ppl_new_Octagonal_Shape_Uint64_t_from_Double_Box_with_complexity, 445
ppl_new_Octagonal_Shape_Uint64_t_from_Float_Box, 443
ppl_new_Octagonal_Shape_Uint64_t_from_Float_Box_with_complexity, 445
ppl_new_Octagonal_Shape_Uint64_t_from_generators, 446
ppl_new_Octagonal_Shape_Uint64_t_from_Grid, 443
ppl_new_Octagonal_Shape_Uint64_t_from_Grid_with_complexity, 445
ppl_new_Octagonal_Shape_Uint64_t_from_Int16_Box, 442
ppl_new_Octagonal_Shape_Uint64_t_from_Int16_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint64_t_from_Int32_Box, 442
ppl_new_Octagonal_Shape_Uint64_t_from_Int32_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint64_t_from_Int64_Box, 442
ppl_new_Octagonal_Shape_Uint64_t_from_Int64_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint64_t_from_Int8_Box, 442
ppl_new_Octagonal_Shape_Uint64_t_from_Int8_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint64_t_from_NNC_Polyhedron, 443
ppl_new_Octagonal_Shape_Uint64_t_from_Octagonal_Shape_double, 443
ppl_new_Octagonal_Shape_Uint64_t_from_Octagonal_Shape_long_double, 445
ppl_new_Octagonal_Shape_Uint64_t_from_Octagonal_Shape_mpq_class, 443
ppl_new_Octagonal_Shape_Uint64_t_from_space_dimension, 442
ppl_new_Octagonal_Shape_Uint64_t_from_Uint16_t, 443
ppl_new_Octagonal_Shape_Uint64_t_from_Uint32_t, 444
ppl_new_Octagonal_Shape_Uint64_t_from_Uint64_t, 443
ppl_new_Octagonal_Shape_Uint64_t_from_Uint8_t, 443
ppl_new_Octagonal_Shape_Uint64_t_from_Zero_Dim_Univ, 443
ppl_new_Octagonal_Shape_Uint8_t_from_Box, 444
ppl_new_Octagonal_Shape_Uint8_t_from_C_Polyhedron, 443
ppl_new_Octagonal_Shape_Uint8_t_from_congruences, 445
ppl_new_Octagonal_Shape_Uint8_t_from_constraints, 443
ppl_new_Octagonal_Shape_Uint8_t_from_Double_Box, 443
ppl_new_Octagonal_Shape_Uint8_t_from_Double_Box_with_complexity, 443
ppl_new_Octagonal_Shape_Uint8_t_from_Float_Box, 443
ppl_new_Octagonal_Shape_Uint8_t_from_Float_Box_with_complexity, 443
ppl_new_Octagonal_Shape_Uint8_t_from_generators, 446
ppl_new_Octagonal_Shape_Uint8_t_from_Grid, 443
ppl_new_Octagonal_Shape_Uint8_t_from_Grid_with_complexity, 445
ppl_new_Octagonal_Shape_Uint8_t_from_Int16_Box, 442
ppl_new_Octagonal_Shape_Uint8_t_from_Int16_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint8_t_from_Int32_Box, 442
ppl_new_Octagonal_Shape_Uint8_t_from_Int32_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint8_t_from_Int64_Box, 442
ppl_new_Octagonal_Shape_Uint8_t_from_Int64_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint8_t_from_Int8_Box, 442
ppl_new_Octagonal_Shape_Uint8_t_from_Int8_Box_with_complexity, 444
ppl_new_Octagonal_Shape_Uint8_t_from_NNC_Polyhedron, 443
ppl_new_Octagonal_Shape_Uint8_t_from_Octagonal_Shape_double, 443
ppl_new_Octagonal_Shape_Uint8_t_from_Octagonal_Shape_long_double, 445
ppl_new_Octagonal_Shape_Uint8_t_from_Octagonal_Shape_mpq_class, 443
ppl_new_Octagonal_Shape_Uint8_t_from_space_dimension, 442
ppl_new_Octagonal_Shape_Uint8_t_from_Uint16_t, 443
ppl_new_Octagonal_Shape_Uint8_t_from_Uint32_t, 444
ppl_new_Octagonal_Shape_Uint8_t_from_Uint64_t, 443
ppl_new_Octagonal_Shape_Uint8_t_from_Uint8_t, 443
ppl_new_Octagonal_Shape_Uint8_t_from_Zero_Dim_Univ, 443

444 442
ppl_new_Octagonal_Shape_long_double_from_Uint8_Box, ppl_new_Octagonal_Shape_long_double_from_Uint16_B
442 442
ppl_new_Octagonal_Shape_long_double_from_Uint8_Box_with_complexity, ppl_new_Octagonal_Shape_long_double_from_Uint16_B
444 444
ppl_new_Octagonal_Shape_long_double_from_Uint16_Box, ppl_new_Octagonal_Shape_long_double_from_Uint32_B
443 442
ppl_new_Octagonal_Shape_long_double_from_Uint16_Box_with_complexity, ppl_new_Octagonal_Shape_long_double_from_Uint32_B
445 444
ppl_new_Octagonal_Shape_long_double_from_Uint32_Box, ppl_new_Octagonal_Shape_long_double_from_Uint64_B
443 442
ppl_new_Octagonal_Shape_long_double_from_Uint32_Box_with_complexity, ppl_new_Octagonal_Shape_long_double_from_Uint64_B
445 444
ppl_new_Octagonal_Shape_long_double_from_Uint64_Box, ppl_new_Octagonal_Shape_long_double_from_Uint8_Bo
443 442
ppl_new_Octagonal_Shape_long_double_from_Uint64_Box_with_complexity, ppl_new_Octagonal_Shape_long_double_from_Uint8_Bo
445 444
ppl_new_Octagonal_Shape_long_double_from_Z_Box, ppl_new_Octagonal_Shape_long_double_from_Z_Box_wi
443 442
ppl_new_Octagonal_Shape_long_double_from_Z_Box_with_complexity, ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_
445 444
ppl_new_Octagonal_Shape_long_double_from_mpq_class, ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_
443 181
ppl_new_Octagonal_Shape_long_double_from_mpq_class_with_complexity, ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_
445 183
ppl_new_Octagonal_Shape_long_double_from_mpz_class, ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_
443 181
ppl_new_Octagonal_Shape_long_double_from_mpz_class_with_complexity, ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_
445 182
ppl_new_Octagonal_Shape_long_double_from_mpz_t, ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_
443 180
ppl_new_Octagonal_Shape_long_double_from_mpz_t_with_complexity, ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_
444 182
ppl_new_Octagonal_Shape_long_double_from_ppl_Box, ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_
443 180
ppl_new_Octagonal_Shape_long_double_from_ppl_Box_with_complexity, ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_
446 182
ppl_new_Octagonal_Shape_long_double_from_ppl_C_Polyhedron, ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_
443 180
ppl_new_Octagonal_Shape_long_double_from_ppl_C_Polyhedron_with_complexity, ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_
445 182
ppl_new_Octagonal_Shape_long_double_from_ppl_Grid, ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_
443 181
ppl_new_Octagonal_Shape_long_double_from_ppl_Grid_with_complexity, ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_
445 183
ppl_new_Octagonal_Shape_long_double_from_ppl_NNC_Polyhedron, ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_
442 180
ppl_new_Octagonal_Shape_long_double_from_ppl_NNC_Polyhedron_with_complexity, ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_
444 182
ppl_new_Octagonal_Shape_long_double_from_space_dimension, ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_

180 181
ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_mpq_class, ppl_new_Octagonal_Shape_mpq_class_from_C_Polyhedron_ascii_load_mpq_class, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
182 183
ppl_new_Octagonal_Shape_mpq_class_from_C_Polyhedron_mpq_class, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
180 180
ppl_new_Octagonal_Shape_mpq_class_from_C_Polyhedron_with_complexity, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
182 182
ppl_new_Octagonal_Shape_mpq_class_from_congruences, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
183 180
ppl_new_Octagonal_Shape_mpq_class_from_constraints, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
183 182
ppl_new_Octagonal_Shape_mpq_class_from_double_box, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
181 180
ppl_new_Octagonal_Shape_mpq_class_from_double_box_with_complexity, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
183 182
ppl_new_Octagonal_Shape_mpq_class_from_float_box, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
181 180
ppl_new_Octagonal_Shape_mpq_class_from_float_box_with_complexity, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
182 182
ppl_new_Octagonal_Shape_mpq_class_from_generators, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
183 181
ppl_new_Octagonal_Shape_mpq_class_from_Grid, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
180 183
ppl_new_Octagonal_Shape_mpq_class_from_Grid_with_complexity, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
182 180
ppl_new_Octagonal_Shape_mpq_class_from_int16_box, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
180 182
ppl_new_Octagonal_Shape_mpq_class_from_int16_box_with_complexity, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
181 180
ppl_new_Octagonal_Shape_mpq_class_from_int32_box, ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_
180 182
ppl_new_Octagonal_Shape_mpq_class_from_int32_box_with_complexity, ppl_new_Octagonal_Shape_mpq_class_from_Rational_
181 180
ppl_new_Octagonal_Shape_mpq_class_from_int64_box, ppl_new_Octagonal_Shape_mpq_class_from_Rational_
180 181
ppl_new_Octagonal_Shape_mpq_class_from_int64_box_with_complexity, ppl_new_Octagonal_Shape_mpq_class_from_space_dime
181 179
ppl_new_Octagonal_Shape_mpq_class_from_int8_box, ppl_new_Octagonal_Shape_mpq_class_from_Uint16_Box
179 180
ppl_new_Octagonal_Shape_mpq_class_from_int8_box_with_complexity, ppl_new_Octagonal_Shape_mpq_class_from_Uint16_Box
181 181
ppl_new_Octagonal_Shape_mpq_class_from_Long_Double_Box, ppl_new_Octagonal_Shape_mpq_class_from_Uint32_Box
181 180
ppl_new_Octagonal_Shape_mpq_class_from_Long_Double_Box_with_complexity, ppl_new_Octagonal_Shape_mpq_class_from_Uint32_Box
183 181
ppl_new_Octagonal_Shape_mpq_class_from_NNC_Polyhedron, ppl_new_Octagonal_Shape_mpq_class_from_Uint64_Box
180 180
ppl_new_Octagonal_Shape_mpq_class_from_NNC_Polyhedron_with_complexity, ppl_new_Octagonal_Shape_mpq_class_from_Uint64_Box
182 181
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape, ppl_new_Octagonal_Shape_mpq_class_from_Uint8_Box,
181 180
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_with_complexity, ppl_new_Octagonal_Shape_mpq_class_from_Uint8_Box
183 181
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_float, ppl_new_Octagonal_Shape_mpq_class_from_Z_Box,

ppl_new_Octagonal_Shape_mpq_class_from_Box 180
ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpz_class 181
ppl_new_Octagonal_Shape_mpz_class_from_C_Polyhedron 172
ppl_new_Octagonal_Shape_mpz_class_from_Constraint_System 174
ppl_new_Octagonal_Shape_mpz_class_from_Constraint_System_and_Complexity_Class 172
ppl_new_Octagonal_Shape_mpz_class_from_Constraint_System_and_Complexity_Class_with_complexity 174
ppl_new_Octagonal_Shape_mpz_class_from_Generator_System 172
ppl_new_Octagonal_Shape_mpz_class_from_Generator_System_and_Complexity_Class 171
ppl_new_Octagonal_Shape_mpz_class_from_Generator_System_and_Complexity_Class_with_complexity 174
ppl_new_Octagonal_Shape_mpz_class_from_Grid 171
ppl_new_Octagonal_Shape_mpz_class_from_Grid_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Grid_and_Complexity_Class_with_complexity 171
ppl_new_Octagonal_Shape_mpz_class_from_Grid_with_Complexity 173
ppl_new_Octagonal_Shape_mpz_class_from_Int16_Box 171
ppl_new_Octagonal_Shape_mpz_class_from_Int16_Box_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Int16_Box_and_Complexity_Class_with_complexity 171
ppl_new_Octagonal_Shape_mpz_class_from_Int32_Box 171
ppl_new_Octagonal_Shape_mpz_class_from_Int32_Box_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Int32_Box_and_Complexity_Class_with_complexity 171
ppl_new_Octagonal_Shape_mpz_class_from_Int64_Box 171
ppl_new_Octagonal_Shape_mpz_class_from_Int64_Box_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Int64_Box_and_Complexity_Class_with_complexity 171
ppl_new_Octagonal_Shape_mpz_class_from_Int8_Box 171
ppl_new_Octagonal_Shape_mpz_class_from_Int8_Box_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Int8_Box_and_Complexity_Class_with_complexity 171
ppl_new_Octagonal_Shape_mpz_class_from_Long_Double_Box 171
ppl_new_Octagonal_Shape_mpz_class_from_Long_Double_Box_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Long_Double_Box_and_Complexity_Class_with_complexity 172
ppl_new_Octagonal_Shape_mpz_class_from_NNC_Polyhedron 172
ppl_new_Octagonal_Shape_mpz_class_from_NNC_Polyhedron_and_Complexity_Class 174
ppl_new_Octagonal_Shape_mpz_class_from_NNC_Polyhedron_and_Complexity_Class_with_complexity 174
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpq_class 171
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpq_class_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpq_class_and_Complexity_Class_with_complexity 171
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class 171
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class_and_Complexity_Class_with_complexity 171
ppl_new_Octagonal_Shape_mpz_class_from_Polyhedron 172
ppl_new_Octagonal_Shape_mpz_class_from_Polyhedron_and_Complexity_Class 174
ppl_new_Octagonal_Shape_mpz_class_from_Polyhedron_and_Complexity_Class_with_complexity 174
ppl_new_Octagonal_Shape_mpz_class_from_Recurrent_Octagonal_Shape_mpz_class 174
ppl_new_Octagonal_Shape_mpz_class_from_Universe_Octagonal_Shape_mpz_class 174
ppl_new_Octagonal_Shape_mpz_class_from_Double_Box 172
ppl_new_Octagonal_Shape_mpz_class_from_Double_Box_and_Complexity_Class 174
ppl_new_Octagonal_Shape_mpz_class_from_Float_Box 172
ppl_new_Octagonal_Shape_mpz_class_from_Float_Box_and_Complexity_Class 174
ppl_new_Octagonal_Shape_mpz_class_from_Generators 174
ppl_new_Octagonal_Shape_mpz_class_from_Grid 172
ppl_new_Octagonal_Shape_mpz_class_from_Grid_with_Complexity 174
ppl_new_Octagonal_Shape_mpz_class_from_Int16_Box 172
ppl_new_Octagonal_Shape_mpz_class_from_Int16_Box_and_Complexity_Class 174
ppl_new_Octagonal_Shape_mpz_class_from_Int16_Box_and_Complexity_Class_with_complexity 171
ppl_new_Octagonal_Shape_mpz_class_from_Int32_Box 171
ppl_new_Octagonal_Shape_mpz_class_from_Int32_Box_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Int32_Box_and_Complexity_Class_with_complexity 171
ppl_new_Octagonal_Shape_mpz_class_from_Int64_Box 171
ppl_new_Octagonal_Shape_mpz_class_from_Int64_Box_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Int64_Box_and_Complexity_Class_with_complexity 171
ppl_new_Octagonal_Shape_mpz_class_from_Int8_Box 171
ppl_new_Octagonal_Shape_mpz_class_from_Int8_Box_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Int8_Box_and_Complexity_Class_with_complexity 171
ppl_new_Octagonal_Shape_mpz_class_from_Long_Double_Box 171
ppl_new_Octagonal_Shape_mpz_class_from_Long_Double_Box_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Long_Double_Box_and_Complexity_Class_with_complexity 172
ppl_new_Octagonal_Shape_mpz_class_from_NNC_Polyhedron 172
ppl_new_Octagonal_Shape_mpz_class_from_NNC_Polyhedron_and_Complexity_Class 174
ppl_new_Octagonal_Shape_mpz_class_from_NNC_Polyhedron_and_Complexity_Class_with_complexity 174
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpq_class 171
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpq_class_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpq_class_and_Complexity_Class_with_complexity 171
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class 171
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class_and_Complexity_Class 173
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class_and_Complexity_Class_with_complexity 171
ppl_new_Octagonal_Shape_mpz_class_from_Polyhedron 172
ppl_new_Octagonal_Shape_mpz_class_from_Polyhedron_and_Complexity_Class 174
ppl_new_Octagonal_Shape_mpz_class_from_Polyhedron_and_Complexity_Class_with_complexity 174
ppl_new_Octagonal_Shape_mpz_class_from_Recurrent_Octagonal_Shape_mpz_class 174
ppl_new_Octagonal_Shape_mpz_class_from_Universe_Octagonal_Shape_mpz_class 174
ppl_new_Octagonal_Shape_mpz_class_from_Double_Box 172
ppl_new_Octagonal_Shape_mpz_class_from_Double_Box_and_Complexity_Class 174
ppl_new_Octagonal_Shape_mpz_class_from_Float_Box 172
ppl_new_Octagonal_Shape_mpz_class_from_Float_Box_and_Complexity_Class 174

173
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_long_double, 416
172
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_long_double_with_complexity, 421
174
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpq_class, 380
172
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpq_class_with_complexity, 380
173
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class, 380
172
ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class_with_complexity, 380
173
ppl_new_Octagonal_Shape_mpz_class_from_Rational_Box, 380
171
ppl_new_Octagonal_Shape_mpz_class_from_Rational_Box_with_complexity, 380
173
ppl_new_Octagonal_Shape_mpz_class_from_space_dimension, 380
171
ppl_new_Octagonal_Shape_mpz_class_from_Uint64_Box, 384
171
ppl_new_Octagonal_Shape_mpz_class_from_Uint64_Box_with_complexity, 254
172
ppl_new_Octagonal_Shape_mpz_class_from_Uint8_Box, 254
171
ppl_new_Octagonal_Shape_mpz_class_from_Uint8_Box_with_complexity, 254
173
ppl_new_Octagonal_Shape_mpz_class_from_Uint_Box, 254
171
ppl_new_Octagonal_Shape_mpz_class_from_Uint_Box_with_complexity, 254
173
ppl_new_Octagonal_Shape_mpz_class_from_Uint_Box, 254
171
ppl_new_Octagonal_Shape_mpz_class_from_Uint_Box_with_complexity, 254
172
ppl_new_Octagonal_Shape_mpz_class_from_Z_Box, 258
171
ppl_new_Octagonal_Shape_mpz_class_from_Z_Box_with_complexity, 259
173
ppl_new_PIP_Problem, 23
ppl_new_PIP_Problem_from_space_dimension, 259
23
ppl_new_Pointset_Powerset_BD_Shape_double_from_BD_Shape_double, 259
417
ppl_new_Pointset_Powerset_BD_Shape_double_from_BD_Shape_double_with_complexity, 259
417
ppl_new_Pointset_Powerset_BD_Shape_double_from_congruences, 259
417
ppl_new_Pointset_Powerset_BD_Shape_double_from_constraints, 259
417
ppl_new_Pointset_Powerset_BD_Shape_double_from_Pointset_Powerset_BD_Shape_int32_t, 263
417
ppl_new_Pointset_Powerset_BD_Shape_double_from_Pointset_Powerset_BD_Shape_int64_t_with 264
417
ppl_new_Pointset_Powerset_BD_Shape_double_from_sp
ppl_new_Pointset_Powerset_BD_Shape_double_iterato
ppl_new_Pointset_Powerset_BD_Shape_float_from_BD_
ppl_new_Pointset_Powerset_BD_Shape_float_from_BD_
ppl_new_Pointset_Powerset_BD_Shape_float_from_cor
ppl_new_Pointset_Powerset_BD_Shape_float_from_cor
ppl_new_Pointset_Powerset_BD_Shape_float_from_Poi
ppl_new_Pointset_Powerset_BD_Shape_float_from_Poi
ppl_new_Pointset_Powerset_BD_Shape_float_from_spa
ppl_new_Pointset_Powerset_BD_Shape_float_iterator
ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_B
ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_B
ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_c
ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_c
ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_B
ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_B
ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_s
ppl_new_Pointset_Powerset_BD_Shape_int16_t_iterat
ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_B
ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_B
ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_c
ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_c
ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_B
ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_s
ppl_new_Pointset_Powerset_BD_Shape_int32_t_iterat
ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_B

ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_Pointset_Powerset_BD_Shape_int64_t, 264
ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_Pointset_Powerset_BD_Shape_int64_t, 269
ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_BD_Shape_mpq_class, 264
ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_C_Polyhedron, 269
ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_Constraint_System, 264
ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_Constraints_and_Generators, 269
ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_Generator_System, 264
ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_NNC_Polyhedron, 273
ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_Pointset_Powerset_BD_Shape_int64_t, 264
ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_Pointset_Powerset_BD_Shape_mpz_class, 274
ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_space_dimension, 264
ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_BD_Shape_mpz_class, 274
ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_with_complexity, 268
ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_BD_Shape_mpz_class, 274
ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_BD_Shape_mpz_class_with_complexity, 249
ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_C_Polyhedron, 274
ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_Constraint_System, 250
ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_Constraints_and_Generators, 274
ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_Generator_System, 249
ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_NNC_Polyhedron, 274
ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_Pointset_Powerset_BD_Shape_mpz_class, 249
ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_Pointset_Powerset_C_Polyhedron, 278
ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_Pointset_Powerset_NNC_Polyhedron, 249
ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_space_dimension, 308
ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_with_complexity, 249
ppl_new_Pointset_Powerset_C_Polyhedron_from_C_Polyhedron, 308
ppl_new_Pointset_Powerset_C_Polyhedron_from_Constraint_System, 253
ppl_new_Pointset_Powerset_C_Polyhedron_from_Constraints_and_Generators, 308
ppl_new_Pointset_Powerset_C_Polyhedron_from_Generator_System, 456
ppl_new_Pointset_Powerset_C_Polyhedron_from_NNC_Polyhedron, 308
ppl_new_Pointset_Powerset_C_Polyhedron_from_with_complexity, 456
ppl_new_Pointset_Powerset_C_Polyhedron_from_Pointset_Powerset_C_Polyhedron, 308
ppl_new_Pointset_Powerset_C_Polyhedron_from_space_dimension, 456
ppl_new_Pointset_Powerset_C_Polyhedron_from_with_complexity, 308
ppl_new_Pointset_Powerset_NNC_Polyhedron_from_BD_Shape_int64_t, 456
ppl_new_Pointset_Powerset_NNC_Polyhedron_from_Pointset_Powerset_NNC_Polyhedron, 312
ppl_new_Pointset_Powerset_NNC_Polyhedron_from_space_dimension, 456
ppl_new_Pointset_Powerset_NNC_Polyhedron_from_with_complexity, 412
ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_Octagonal_Shape_double, 455
ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_space_dimension, 412
ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_with_complexity, 460
ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_Box, 412
ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpq_class, 269
ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_Pointset_Powerset_Octagonal_Shape_mpq_class, 412
ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_space_dimension, 269
ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_with_complexity, 412
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Box, 269
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class, 412
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Pointset_Powerset_Octagonal_Shape_mpz_class, 269
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_space_dimension, 412
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_with_complexity, 269

ppl_new_Pointset_Powerset_Double_Box_iterator_from_iterator, 416
ppl_new_Pointset_Powerset_Float_Box_from_Box, 376
ppl_new_Pointset_Powerset_Float_Box_from_Pointset, 376
ppl_new_Pointset_Powerset_Float_Box_from_Pointset_with_complexity, 375
ppl_new_Pointset_Powerset_Float_Box_from_space_dimensions, 376
ppl_new_Pointset_Powerset_Float_Box_from_Pointset_Powerset_Float_Box, 375
ppl_new_Pointset_Powerset_Float_Box_from_Pointset_Powerset_Float_Box_with_complexity, 376
ppl_new_Pointset_Powerset_Float_Box_from_constraints, 375
ppl_new_Pointset_Powerset_Float_Box_from_iterator, 379
ppl_new_Pointset_Powerset_Grid_from_congruences, 318
ppl_new_Pointset_Powerset_Grid_from_Pointset, 318
ppl_new_Pointset_Powerset_Grid_from_Grid, 318
ppl_new_Pointset_Powerset_Grid_from_Grid_with_complexity, 318
ppl_new_Pointset_Powerset_Grid_from_Pointset_Powerset_Grid, 318
ppl_new_Pointset_Powerset_Grid_from_Pointset_Powerset_Grid_with_complexity, 318
ppl_new_Pointset_Powerset_Grid_from_space_dimensions, 318
ppl_new_Pointset_Powerset_Grid_iterator_from_iterator, 321
ppl_new_Pointset_Powerset_Int16_Box_from_Box, 210
ppl_new_Pointset_Powerset_Int16_Box_from_Pointset, 210
ppl_new_Pointset_Powerset_Int16_Box_from_Pointset_with_complexity, 210
ppl_new_Pointset_Powerset_Int16_Box_from_space_dimensions, 210
ppl_new_Pointset_Powerset_Int16_Box_from_Pointset_Powerset_Int16_Box, 210
ppl_new_Pointset_Powerset_Int16_Box_from_Pointset_Powerset_Int16_Box_with_complexity, 210
ppl_new_Pointset_Powerset_Int16_Box_from_constraints, 213
ppl_new_Pointset_Powerset_Int16_Box_from_iterator, 214
ppl_new_Pointset_Powerset_Int32_Box_from_Box, 214
ppl_new_Pointset_Powerset_Int32_Box_from_Pointset, 214
ppl_new_Pointset_Powerset_Int32_Box_from_Pointset_with_complexity, 214
ppl_new_Pointset_Powerset_Int32_Box_from_space_dimensions, 214
ppl_new_Pointset_Powerset_Int32_Box_from_Pointset_Powerset_Int32_Box, 214
ppl_new_Pointset_Powerset_Int32_Box_from_Pointset_Powerset_Int32_Box_with_complexity, 214
ppl_new_Pointset_Powerset_Int32_Box_from_constraints, 214
ppl_new_Pointset_Powerset_Int32_Box_from_iterator, 218
ppl_new_Pointset_Powerset_Int64_Box_from_Box, 219
ppl_new_Pointset_Powerset_Int64_Box_from_Pointset, 219
ppl_new_Pointset_Powerset_Int64_Box_from_Pointset_with_complexity, 218
ppl_new_Pointset_Powerset_Int64_Box_from_space_dimensions, 219
ppl_new_Pointset_Powerset_Int64_Box_from_Pointset_Powerset_Int64_Box, 218
ppl_new_Pointset_Powerset_Int64_Box_from_Pointset_Powerset_Int64_Box_with_complexity, 218
ppl_new_Pointset_Powerset_Int64_Box_from_constraints, 218
ppl_new_Pointset_Powerset_Int64_Box_from_iterator, 222
ppl_new_Pointset_Powerset_Int8_Box_from_Box, 205
ppl_new_Pointset_Powerset_Int8_Box_from_Pointset, 205
ppl_new_Pointset_Powerset_Int8_Box_from_Pointset_Powerset_Int8_Box, 205
ppl_new_Pointset_Powerset_Int8_Box_from_Pointset_Powerset_Int8_Box_with_complexity, 205
ppl_new_Pointset_Powerset_Int8_Box_from_space_dimensions, 205
ppl_new_Pointset_Powerset_Int8_Box_from_Pointset_Powerset_Int8_Box_iterator_from_iterator, 209
ppl_new_Pointset_Powerset_Int8_Box_from_Pointset_Powerset_Int8_Box_with_complexity, 451
ppl_new_Pointset_Powerset_Long_Double_Box_from_constraints, 451
ppl_new_Pointset_Powerset_Long_Double_Box_from_iterator, 451
ppl_new_Pointset_Powerset_Long_Double_Box_from_Box, 451
ppl_new_Pointset_Powerset_Long_Double_Box_from_Pointset, 451

ppl_new_Pointset_Powerset_Long_Double... 451
ppl_new_Pointset_Powerset_Long_Double... 451
ppl_new_Pointset_Powerset_Long_Double... 455
ppl_new_Pointset_Powerset_NNC_Polyhedr... 313
ppl_new_Pointset_Powerset_NNC_Polyhedr... 313
ppl_new_Pointset_Powerset_NNC_Polyhedr... 313
ppl_new_Pointset_Powerset_NNC_Polyhedr... 313
ppl_new_Pointset_Powerset_NNC_Polyhedr... 313
ppl_new_Pointset_Powerset_NNC_Polyhedr... 313
ppl_new_Pointset_Powerset_NNC_Polyhedr... 313
ppl_new_Pointset_Powerset_NNC_Polyhedr... 317
ppl_new_Pointset_Powerset_Octagonal_Sh... 422
ppl_new_Pointset_Powerset_Octagonal_Sh... 422
ppl_new_Pointset_Powerset_Octagonal_Sh... 422
ppl_new_Pointset_Powerset_Octagonal_Sh... 422
ppl_new_Pointset_Powerset_Octagonal_Sh... 421
ppl_new_Pointset_Powerset_Octagonal_Sh... 422
ppl_new_Pointset_Powerset_Octagonal_Sh... 421
ppl_new_Pointset_Powerset_Octagonal_Sh... 426
ppl_new_Pointset_Powerset_Octagonal_Sh... 385
ppl_new_Pointset_Powerset_Octagonal_Sh... 385
ppl_new_Pointset_Powerset_Octagonal_Sh... 385
ppl_new_Pointset_Powerset_Octagonal_Sh... 385
ppl_new_Pointset_Powerset_Octagonal_Sh... 385
ppl_new_Pointset_Powerset_Octagonal_Sh... 385
ppl_new_Pointset_Powerset_Octagonal_Sh... 389
ppl_new_Pointset_Powerset_Octagonal_Sh... 284
ppl_new_Pointset_Powerset_Octagonal_Sh... 284
ppl_new_Pointset_Powerset_Octagonal_Sh... 284
ppl_new_Pointset_Powerset_Octagonal_Sh... 284
ppl_new_Pointset_Powerset_Octagonal_Sh... 284
ppl_new_Pointset_Powerset_Octagonal_Sh... 284
ppl_new_Pointset_Powerset_Octagonal_Sh... 284
ppl_new_Pointset_Powerset_Octagonal_Sh... 288
ppl_new_Pointset_Powerset_Octagonal_Sh... 289
ppl_new_Pointset_Powerset_Octagonal_Sh... 289
ppl_new_Pointset_Powerset_Octagonal_Sh... 289
ppl_new_Pointset_Powerset_Octagonal_Sh... 289
ppl_new_Pointset_Powerset_Octagonal_Sh... 289
ppl_new_Pointset_Powerset_Octagonal_Sh... 289
ppl_new_Pointset_Powerset_Octagonal_Sh... 288
ppl_new_Pointset_Powerset_Octagonal_Sh... 293
ppl_new_Pointset_Powerset_Octagonal_Sh... 294
ppl_new_Pointset_Powerset_Octagonal_Sh... 294
ppl_new_Pointset_Powerset_Octagonal_Sh... 294
ppl_new_Pointset_Powerset_Octagonal_Sh... 294
ppl_new_Pointset_Powerset_Octagonal_Sh... 293
ppl_new_Pointset_Powerset_Octagonal_Sh... 294
ppl_new_Pointset_Powerset_Octagonal_Sh... 293
ppl_new_Pointset_Powerset_Octagonal_Sh... 298
ppl_new_Pointset_Powerset_Octagonal_Sh... 279
ppl_new_Pointset_Powerset_Octagonal_Sh... 279
ppl_new_Pointset_Powerset_Octagonal_Sh... 279

ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Pointset_Powerset_Octagonal_Shape_mpz_class, 279, 303
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Pointset_Powerset_Octagonal_Shape_mpz_class, 279, 307
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Rational_Box, 279, 241
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_space_dimension, 279, 241
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Variables_Set, 283, 240
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 461, 240
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 461, 240
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 461, 241
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 461, 240
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 461, 244
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 461, 227
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 460, 227
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 465, 227
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 299, 227
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 299, 227
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 298, 227
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 299, 227
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 298, 231
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 299, 232
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_space_dimension, 298, 232
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Variables_Set, 303, 232
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 304, 232
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_space_dimension, 304, 231
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Variables_Set, 303, 232
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 304, 232
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 303, 235
ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Wrapped_Polyhedron, 303, 236

ppl_new_Pointset_Powerset_Uint64_Box_from_BD_Shape_int16_t, 236
ppl_new_Pointset_Powerset_Uint64_Box_from_BD_Shape_int16_t_with_complexity, 236
ppl_new_Pointset_Powerset_Uint64_Box_from_BD_Shape_int32_t, 236
ppl_new_Pointset_Powerset_Uint64_Box_from_BD_Shape_int32_t_with_complexity, 236
ppl_new_Pointset_Powerset_Uint64_Box_from_BD_Shape_int64_t, 236
ppl_new_Pointset_Powerset_Uint64_Box_from_BD_Shape_int64_t_with_complexity, 236
ppl_new_Pointset_Powerset_Uint64_Box_from_BD_Shape_int8_t, 240
ppl_new_Pointset_Powerset_Uint8_Box_from_BD_Shape_int8_t_with_complexity, 223
ppl_new_Pointset_Powerset_Uint8_Box_from_BD_Shape_long_double, 223
ppl_new_Pointset_Powerset_Uint8_Box_from_BD_Shape_long_double_with_complexity, 223
ppl_new_Pointset_Powerset_Uint8_Box_from_BD_Shape_mpq_class, 223
ppl_new_Pointset_Powerset_Uint8_Box_from_BD_Shape_mpq_class_with_complexity, 223
ppl_new_Pointset_Powerset_Uint8_Box_from_BD_Shape_mpz_class, 223
ppl_new_Pointset_Powerset_Uint8_Box_from_BD_Shape_mpz_class_with_complexity, 223
ppl_new_Pointset_Powerset_Uint8_Box_from_C_Polyhedron, 227
ppl_new_Pointset_Powerset_Z_Box_from_C_Polyhedron_with_complexity, 245
ppl_new_Pointset_Powerset_Z_Box_from_congruences, 245
ppl_new_Pointset_Powerset_Z_Box_from_constraints, 245
ppl_new_Pointset_Powerset_Z_Box_from_Double_Box, 245
ppl_new_Pointset_Powerset_Z_Box_from_Double_Box_with_complexity, 245
ppl_new_Pointset_Powerset_Z_Box_from_generators, 249
ppl_new_Rational_Box_from_BD_Shape_double, 83
ppl_new_Rational_Box_from_BD_Shape_double_with_complexity, 84
ppl_new_Rational_Box_from_BD_Shape_float, 83
ppl_new_Rational_Box_from_BD_Shape_float_with_complexity, 84
ppl_new_Rational_Box_from_BD_Shape_int16_t, 82
ppl_new_Rational_Box_from_BD_Shape_int16_t_with_complexity, 83
ppl_new_Rational_Box_from_BD_Shape_int32_t, 82
ppl_new_Rational_Box_from_BD_Shape_int32_t_with_complexity, 83
ppl_new_Rational_Box_from_BD_Shape_int64_t, 82
ppl_new_Rational_Box_from_BD_Shape_int64_t_with_complexity, 83
ppl_new_Rational_Box_from_BD_Shape_int8_t, 82
ppl_new_Rational_Box_from_BD_Shape_int8_t_with_complexity, 83
ppl_new_Rational_Box_from_BD_Shape_long_double, 83
ppl_new_Rational_Box_from_BD_Shape_long_double_with_complexity, 85
ppl_new_Rational_Box_from_BD_Shape_mpq_class, 82
ppl_new_Rational_Box_from_BD_Shape_mpq_class_with_complexity, 84
ppl_new_Rational_Box_from_BD_Shape_mpz_class, 82
ppl_new_Rational_Box_from_BD_Shape_mpz_class_with_complexity, 84
ppl_new_Rational_Box_from_C_Polyhedron, 82
ppl_new_Rational_Box_from_C_Polyhedron_with_complexity, 84
ppl_new_Rational_Box_from_congruences, 85
ppl_new_Rational_Box_from_constraints, 85
ppl_new_Rational_Box_from_Double_Box, 83
ppl_new_Rational_Box_from_Double_Box_with_complexity, 84
ppl_new_Rational_Box_from_Float_Box, 83
ppl_new_Rational_Box_from_Float_Box_with_complexity, 84
ppl_new_Rational_Box_from_generators, 85
ppl_new_Rational_Box_from_Grid, 82
ppl_new_Rational_Box_from_Grid_with_complexity, 84
ppl_new_Rational_Box_from_Int16_Box, 82
ppl_new_Rational_Box_from_Int16_Box_with_complexity, 83
ppl_new_Rational_Box_from_Int32_Box,

82
ppl_new_Rational_Box_from_Int32_Box_with_complexity,
83
ppl_new_Rational_Box_from_Int64_Box,
82
ppl_new_Rational_Box_from_Int64_Box_with_complexity,
83
ppl_new_Rational_Box_from_Int8_Box,
82
ppl_new_Rational_Box_from_Int8_Box_with_complexity,
83
ppl_new_Rational_Box_from_Long_Double_Box,
83
ppl_new_Rational_Box_from_Long_Double_Box_with_complexity,
84
ppl_new_Rational_Box_from_NNC_Polyhedron,
82
ppl_new_Rational_Box_from_NNC_Polyhedron_with_complexity,
84
ppl_new_Rational_Box_from_Octagonal_Shape_double,
83
ppl_new_Rational_Box_from_Octagonal_Shape_double_with_complexity,
84
ppl_new_Rational_Box_from_Octagonal_Shape_float,
83
ppl_new_Rational_Box_from_Octagonal_Shape_float_with_complexity,
84
ppl_new_Rational_Box_from_Octagonal_Shape_int16_t,
82
ppl_new_Rational_Box_from_Octagonal_Shape_int16_t_with_complexity,
84
ppl_new_Rational_Box_from_Octagonal_Shape_int32_t,
82
ppl_new_Rational_Box_from_Octagonal_Shape_int32_t_with_complexity,
84
ppl_new_Rational_Box_from_Octagonal_Shape_int64_t,
82
ppl_new_Rational_Box_from_Octagonal_Shape_int64_t_with_complexity,
84
ppl_new_Rational_Box_from_Octagonal_Shape_int8_t,
82
ppl_new_Rational_Box_from_Octagonal_Shape_int8_t_with_complexity,
84
ppl_new_Rational_Box_from_Octagonal_Shape_long_double,
83
ppl_new_Rational_Box_from_Octagonal_Shape_long_double_with_complexity,
85
ppl_new_Rational_Box_from_Octagonal_Shape_mpq_class,
82
ppl_new_Rational_Box_from_Octagonal_Shape_mpq_class_with_complexity,
84
ppl_new_Rational_Box_from_Octagonal_Shape_mpz_class,
82
ppl_new_Rational_Box_from_Octagonal_Shape_mpz_class_with_complexity,
84
ppl_new_Rational_Box_from_Rational_Box,
82
ppl_new_Rational_Box_from_Rational_Box_with_complexity,
83
ppl_new_Rational_Box_from_space_dimension,
82
ppl_new_Rational_Box_from_Uint16_Box,
82
ppl_new_Rational_Box_from_Uint16_Box_with_complexity,
83
ppl_new_Rational_Box_from_Uint32_Box,
82
ppl_new_Rational_Box_from_Uint32_Box_with_complexity,
83
ppl_new_Rational_Box_from_Uint64_Box,
82
ppl_new_Rational_Box_from_Uint64_Box_with_complexity,
83
ppl_new_Rational_Box_from_Uint8_Box,
82
ppl_new_Rational_Box_from_Uint8_Box_with_complexity,
83
ppl_new_Rational_Box_from_Z_Box, 82
ppl_new_Rational_Box_from_Z_Box_with_complexity,
83
ppl_new_Uint16_Box_from_BD_Shape_double,
57
ppl_new_Uint16_Box_from_BD_Shape_double_with_complexity,
59
ppl_new_Uint16_Box_from_BD_Shape_float,
57
ppl_new_Uint16_Box_from_BD_Shape_float_with_complexity,
59
ppl_new_Uint16_Box_from_BD_Shape_int16_t,
57
ppl_new_Uint16_Box_from_BD_Shape_int16_t_with_complexity,
58
ppl_new_Uint16_Box_from_BD_Shape_int32_t,
57
ppl_new_Uint16_Box_from_BD_Shape_int32_t_with_complexity,
58
ppl_new_Uint16_Box_from_BD_Shape_int64_t,
57
ppl_new_Uint16_Box_from_BD_Shape_int64_t_with_complexity,
58
ppl_new_Uint16_Box_from_BD_Shape_int8_t,
57
ppl_new_Uint16_Box_from_BD_Shape_int8_t_with_complexity,
58
ppl_new_Uint16_Box_from_BD_Shape_long_double,
58
ppl_new_Uint16_Box_from_BD_Shape_long_double_with_complexity,
59

ppl_new_Uint16_Box_from_BD_Shape_mpq, 57
ppl_new_Uint16_Box_from_BD_Shape_mpq_with_complexity, 58
ppl_new_Uint16_Box_from_BD_Shape_mpz, 57
ppl_new_Uint16_Box_from_BD_Shape_mpz_with_complexity, 58
ppl_new_Uint16_Box_from_C_Polyhedron, 57
ppl_new_Uint16_Box_from_C_Polyhedron_with_complexity, 59
ppl_new_Uint16_Box_from_congruences, 59
ppl_new_Uint16_Box_from_constraints, 59
ppl_new_Uint16_Box_from_Double_Box, 57
ppl_new_Uint16_Box_from_Double_Box_with_complexity, 59
ppl_new_Uint16_Box_from_Float_Box, 57
ppl_new_Uint16_Box_from_Float_Box_with_complexity, 59
ppl_new_Uint16_Box_from_generators, 59
ppl_new_Uint16_Box_from_Grid, 57
ppl_new_Uint16_Box_from_Grid_with_complexity, 59
ppl_new_Uint16_Box_from_Int16_Box, 57
ppl_new_Uint16_Box_from_Int16_Box_with_complexity, 58
ppl_new_Uint16_Box_from_Int32_Box, 57
ppl_new_Uint16_Box_from_Int32_Box_with_complexity, 58
ppl_new_Uint16_Box_from_Int64_Box, 57
ppl_new_Uint16_Box_from_Int64_Box_with_complexity, 58
ppl_new_Uint16_Box_from_Int8_Box, 57
ppl_new_Uint16_Box_from_Int8_Box_with_complexity, 58
ppl_new_Uint16_Box_from_Long_Double_Box, 57
ppl_new_Uint16_Box_from_Long_Double_Box_with_complexity, 59
ppl_new_Uint16_Box_from_NNC_Polyhedron, 57
ppl_new_Uint16_Box_from_NNC_Polyhedron_with_complexity, 59
ppl_new_Uint16_Box_from_Octagonal_Shape, 57
ppl_new_Uint16_Box_from_Octagonal_Shape_double, 59
ppl_new_Uint16_Box_from_Octagonal_Shape_float, 57
ppl_new_Uint16_Box_from_Octagonal_Shape_float_with_complexity, 59
ppl_new_Uint16_Box_from_Octagonal_Shape_int16_t, 57
ppl_new_Uint16_Box_from_Octagonal_Shape_int16_t_with_complexity, 58
ppl_new_Uint16_Box_from_Octagonal_Shape_int32_t, 57
ppl_new_Uint16_Box_from_Octagonal_Shape_int32_t_with_complexity, 59
ppl_new_Uint16_Box_from_Octagonal_Shape_int64_t, 57
ppl_new_Uint16_Box_from_Octagonal_Shape_int64_t_with_complexity, 59
ppl_new_Uint16_Box_from_Octagonal_Shape_int8_t, 57
ppl_new_Uint16_Box_from_Octagonal_Shape_int8_t_with_complexity, 58
ppl_new_Uint16_Box_from_Octagonal_Shape_long_double, 58
ppl_new_Uint16_Box_from_Octagonal_Shape_long_double_with_complexity, 59
ppl_new_Uint16_Box_from_Octagonal_Shape_mpq_class, 57
ppl_new_Uint16_Box_from_Octagonal_Shape_mpq_class_with_complexity, 59
ppl_new_Uint16_Box_from_Octagonal_Shape_mpz_class, 57
ppl_new_Uint16_Box_from_Octagonal_Shape_mpz_class_with_complexity, 59
ppl_new_Uint16_Box_from_Rational_Box, 57
ppl_new_Uint16_Box_from_Rational_Box_with_complexity, 58
ppl_new_Uint16_Box_from_space_dimension, 57
ppl_new_Uint16_Box_from_Uint16_Box, 57
ppl_new_Uint16_Box_from_Uint16_Box_with_complexity, 58
ppl_new_Uint16_Box_from_Uint32_Box, 57
ppl_new_Uint16_Box_from_Uint32_Box_with_complexity, 58
ppl_new_Uint16_Box_from_Uint64_Box, 57
ppl_new_Uint16_Box_from_Uint64_Box_with_complexity, 58
ppl_new_Uint16_Box_from_Uint8_Box, 57

ppl_new_Uint16_Box_from_Uint8_Box_with_complexity, 58
ppl_new_Uint16_Box_from_Z_Box, 57
ppl_new_Uint16_Box_from_Z_Box_with_complexity, 58
ppl_new_Uint32_Box_from_BD_Shape_double, 64
ppl_new_Uint32_Box_from_BD_Shape_double_with_complexity, 66
ppl_new_Uint32_Box_from_BD_Shape_float, 64
ppl_new_Uint32_Box_from_BD_Shape_float_with_complexity, 65
ppl_new_Uint32_Box_from_BD_Shape_int16_t, 63
ppl_new_Uint32_Box_from_BD_Shape_int16_t_with_complexity, 65
ppl_new_Uint32_Box_from_BD_Shape_int32_t, 63
ppl_new_Uint32_Box_from_BD_Shape_int32_t_with_complexity, 65
ppl_new_Uint32_Box_from_BD_Shape_int64_t, 63
ppl_new_Uint32_Box_from_BD_Shape_int64_t_with_complexity, 65
ppl_new_Uint32_Box_from_BD_Shape_int8_t, 63
ppl_new_Uint32_Box_from_BD_Shape_int8_t_with_complexity, 64
ppl_new_Uint32_Box_from_BD_Shape_long_double, 64
ppl_new_Uint32_Box_from_BD_Shape_long_double_with_complexity, 66
ppl_new_Uint32_Box_from_BD_Shape_mpq_class, 63
ppl_new_Uint32_Box_from_BD_Shape_mpq_class_with_complexity, 65
ppl_new_Uint32_Box_from_BD_Shape_mpz_class, 63
ppl_new_Uint32_Box_from_BD_Shape_mpz_class_with_complexity, 65
ppl_new_Uint32_Box_from_C_Polyhedron, 64
ppl_new_Uint32_Box_from_C_Polyhedron_with_complexity, 65
ppl_new_Uint32_Box_from_congruences, 66
ppl_new_Uint32_Box_from_constraints, 66
ppl_new_Uint32_Box_from_Double_Box, 64
ppl_new_Uint32_Box_from_Double_Box_with_complexity, 65
ppl_new_Uint32_Box_from_Float_Box, 64
ppl_new_Uint32_Box_from_Float_Box_with_complexity, 65
ppl_new_Uint32_Box_from_generators, 66
ppl_new_Uint32_Box_from_Grid, 64
ppl_new_Uint32_Box_from_Grid_with_complexity, 65
ppl_new_Uint32_Box_from_Int16_Box, 63
ppl_new_Uint32_Box_from_Int16_Box_with_complexity, 64
ppl_new_Uint32_Box_from_Int32_Box, 63
ppl_new_Uint32_Box_from_Int32_Box_with_complexity, 64
ppl_new_Uint32_Box_from_Int64_Box, 63
ppl_new_Uint32_Box_from_Int64_Box_with_complexity, 64
ppl_new_Uint32_Box_from_Int8_Box, 63
ppl_new_Uint32_Box_from_Int8_Box_with_complexity, 64
ppl_new_Uint32_Box_from_Long_Double_Box, 64
ppl_new_Uint32_Box_from_Long_Double_Box_with_complexity, 66
ppl_new_Uint32_Box_from_NNC_Polyhedron, 64
ppl_new_Uint32_Box_from_NNC_Polyhedron_with_complexity, 65
ppl_new_Uint32_Box_from_Octagonal_Shape_double, 64
ppl_new_Uint32_Box_from_Octagonal_Shape_double_with_complexity, 66
ppl_new_Uint32_Box_from_Octagonal_Shape_float, 64
ppl_new_Uint32_Box_from_Octagonal_Shape_float_with_complexity, 65
ppl_new_Uint32_Box_from_Octagonal_Shape_int16_t, 63
ppl_new_Uint32_Box_from_Octagonal_Shape_int16_t_with_complexity, 65
ppl_new_Uint32_Box_from_Octagonal_Shape_int32_t, 64
ppl_new_Uint32_Box_from_Octagonal_Shape_int32_t_with_complexity, 65
ppl_new_Uint32_Box_from_Octagonal_Shape_int64_t, 64
ppl_new_Uint32_Box_from_Octagonal_Shape_int64_t_with_complexity, 65
ppl_new_Uint32_Box_from_Octagonal_Shape_int8_t, 63
ppl_new_Uint32_Box_from_Octagonal_Shape_int8_t_with_complexity,

65
ppl_new_Uint32_Box_from_Octagonal_Shape_long_double,
64
ppl_new_Uint32_Box_from_Octagonal_Shape_long_double_with_complexity,
66
ppl_new_Uint32_Box_from_Octagonal_Shape_mpq_class,
64
ppl_new_Uint32_Box_from_Octagonal_Shape_mpq_class_with_complexity,
65
ppl_new_Uint32_Box_from_Octagonal_Shape_mpz_class,
64
ppl_new_Uint32_Box_from_Octagonal_Shape_mpz_class_with_complexity,
65
ppl_new_Uint32_Box_from_Rational_Box, 63
ppl_new_Uint32_Box_from_Rational_Box_with_complexity,
64
ppl_new_Uint32_Box_from_space_dimension, 63
ppl_new_Uint32_Box_from_Uint16_Box, 63
ppl_new_Uint32_Box_from_Uint16_Box_with_complexity,
64
ppl_new_Uint32_Box_from_Uint32_Box, 63
ppl_new_Uint32_Box_from_Uint32_Box_with_complexity,
64
ppl_new_Uint32_Box_from_Uint64_Box, 63
ppl_new_Uint32_Box_from_Uint64_Box_with_complexity,
64
ppl_new_Uint32_Box_from_Uint8_Box, 63
ppl_new_Uint32_Box_from_Uint8_Box_with_complexity,
64
ppl_new_Uint32_Box_from_Z_Box, 63
ppl_new_Uint32_Box_from_Z_Box_with_complexity,
64
ppl_new_Uint64_Box_from_BD_Shape_double, 70
ppl_new_Uint64_Box_from_BD_Shape_double_with_complexity,
72
ppl_new_Uint64_Box_from_BD_Shape_float, 70
ppl_new_Uint64_Box_from_BD_Shape_float_with_complexity,
72
ppl_new_Uint64_Box_from_BD_Shape_int16_t, 70
ppl_new_Uint64_Box_from_BD_Shape_int16_t_with_complexity,
71
ppl_new_Uint64_Box_from_BD_Shape_int32_t, 70
ppl_new_Uint64_Box_from_BD_Shape_int32_t_with_complexity,
71
ppl_new_Uint64_Box_from_BD_Shape_int64_t, 70
ppl_new_Uint64_Box_from_BD_Shape_int64_t_with_complexity,
71
ppl_new_Uint64_Box_from_BD_Shape_int8_t, 70
ppl_new_Uint64_Box_from_BD_Shape_int8_t_with_complexity,
71
ppl_new_Uint64_Box_from_BD_Shape_long_double, 70
ppl_new_Uint64_Box_from_BD_Shape_long_double_with_complexity,
72
ppl_new_Uint64_Box_from_BD_Shape_mpq_class, 70
ppl_new_Uint64_Box_from_BD_Shape_mpq_class_with_complexity,
71
ppl_new_Uint64_Box_from_BD_Shape_mpz_class, 70
ppl_new_Uint64_Box_from_BD_Shape_mpz_class_with_complexity,
71
ppl_new_Uint64_Box_from_C_Polyhedron, 70
ppl_new_Uint64_Box_from_C_Polyhedron_with_complexity,
72
ppl_new_Uint64_Box_from_congruences, 72
ppl_new_Uint64_Box_from_constraints, 72
ppl_new_Uint64_Box_from_Double_Box, 70
ppl_new_Uint64_Box_from_Double_Box_with_complexity,
72
ppl_new_Uint64_Box_from_Float_Box, 70
ppl_new_Uint64_Box_from_Float_Box_with_complexity,
72
ppl_new_Uint64_Box_from_generators, 72
ppl_new_Uint64_Box_from_Grid, 70
ppl_new_Uint64_Box_from_Grid_with_complexity,
72
ppl_new_Uint64_Box_from_Int16_Box, 69
ppl_new_Uint64_Box_from_Int16_Box_with_complexity,
71
ppl_new_Uint64_Box_from_Int32_Box, 70
ppl_new_Uint64_Box_from_Int32_Box_with_complexity,
71
ppl_new_Uint64_Box_from_Int64_Box, 70
ppl_new_Uint64_Box_from_Int64_Box_with_complexity,
71
ppl_new_Uint64_Box_from_Int8_Box, 69

ppl_new_Uint64_Box_from_Int8_Box_with_complexity, 70
ppl_new_Uint64_Box_from_Long_Double_Box, 70
ppl_new_Uint64_Box_from_Long_Double_Box_with_complexity, 72
ppl_new_Uint64_Box_from_NNC_Polyhedron, 70
ppl_new_Uint64_Box_from_NNC_Polyhedron_with_complexity, 72
ppl_new_Uint64_Box_from_Octagonal_Shape_double, 70
ppl_new_Uint64_Box_from_Octagonal_Shape_double_with_complexity, 72
ppl_new_Uint64_Box_from_Octagonal_Shape_float, 70
ppl_new_Uint64_Box_from_Octagonal_Shape_float_with_complexity, 72
ppl_new_Uint64_Box_from_Octagonal_Shape_int16_t, 70
ppl_new_Uint64_Box_from_Octagonal_Shape_int16_t_with_complexity, 71
ppl_new_Uint64_Box_from_Octagonal_Shape_int32_t, 70
ppl_new_Uint64_Box_from_Octagonal_Shape_int32_t_with_complexity, 71
ppl_new_Uint64_Box_from_Octagonal_Shape_int64_t, 70
ppl_new_Uint64_Box_from_Octagonal_Shape_int64_t_with_complexity, 71
ppl_new_Uint64_Box_from_Octagonal_Shape_int8_t, 70
ppl_new_Uint64_Box_from_Octagonal_Shape_int8_t_with_complexity, 71
ppl_new_Uint64_Box_from_Octagonal_Shape_long_double, 70
ppl_new_Uint64_Box_from_Octagonal_Shape_long_double_with_complexity, 72
ppl_new_Uint64_Box_from_Octagonal_Shape_mpq_class, 70
ppl_new_Uint64_Box_from_Octagonal_Shape_mpq_class_with_complexity, 72
ppl_new_Uint64_Box_from_Octagonal_Shape_mpz_class, 70
ppl_new_Uint64_Box_from_Octagonal_Shape_mpz_class_with_complexity, 72
ppl_new_Uint64_Box_from_Rational_Box, 70
ppl_new_Uint64_Box_from_Rational_Box_with_complexity, 71
ppl_new_Uint64_Box_from_space_dimension, 69
ppl_new_Uint64_Box_from_Uint16_Box, 70
ppl_new_Uint64_Box_from_Uint16_Box_with_complexity, 71
ppl_new_Uint64_Box_from_Uint32_Box, 70
ppl_new_Uint64_Box_from_Uint32_Box_with_complexity, 71
ppl_new_Uint64_Box_from_Uint64_Box, 70
ppl_new_Uint64_Box_from_Uint64_Box_with_complexity, 71
ppl_new_Uint64_Box_from_Uint8_Box, 70
ppl_new_Uint64_Box_from_Uint8_Box_with_complexity, 71
ppl_new_Uint64_Box_from_Z_Box, 70
ppl_new_Uint64_Box_from_Z_Box_with_complexity, 71
ppl_new_Uint8_Box_from_BD_Shape_double, 51
ppl_new_Uint8_Box_from_BD_Shape_double_with_compl
ppl_new_Uint8_Box_from_BD_Shape_float, 51
ppl_new_Uint8_Box_from_BD_Shape_float_with_comple
ppl_new_Uint8_Box_from_BD_Shape_int16_t, 51
ppl_new_Uint8_Box_from_BD_Shape_int16_t_with_comp
ppl_new_Uint8_Box_from_BD_Shape_int32_t, 51
ppl_new_Uint8_Box_from_BD_Shape_int32_t_with_comp
ppl_new_Uint8_Box_from_BD_Shape_int64_t, 51
ppl_new_Uint8_Box_from_BD_Shape_int64_t_with_comp
ppl_new_Uint8_Box_from_BD_Shape_int8_t, 51
ppl_new_Uint8_Box_from_BD_Shape_int8_t_with_compl
ppl_new_Uint8_Box_from_BD_Shape_long_double, 51
ppl_new_Uint8_Box_from_BD_Shape_long_double_with_
ppl_new_Uint8_Box_from_BD_Shape_mpq_class, 51
ppl_new_Uint8_Box_from_BD_Shape_mpq_class_with_co
ppl_new_Uint8_Box_from_BD_Shape_mpz_class, 51
ppl_new_Uint8_Box_from_BD_Shape_mpz_class_with_co
ppl_new_Uint8_Box_from_C_Polyhedron,

51
ppl_new_Uint8_Box_from_C_Polyhedron_with_complexity,
52
ppl_new_Uint8_Box_from_congruences,
53
ppl_new_Uint8_Box_from_constraints,
53
ppl_new_Uint8_Box_from_Double_Box,
51
ppl_new_Uint8_Box_from_Double_Box_with_complexity,
53
ppl_new_Uint8_Box_from_Float_Box, 51
ppl_new_Uint8_Box_from_Float_Box_with_complexity,
53
ppl_new_Uint8_Box_from_generators,
53
ppl_new_Uint8_Box_from_Grid, 51
ppl_new_Uint8_Box_from_Grid_with_complexity,
53
ppl_new_Uint8_Box_from_Int16_Box, 50
ppl_new_Uint8_Box_from_Int16_Box_with_complexity,
51
ppl_new_Uint8_Box_from_Int32_Box, 50
ppl_new_Uint8_Box_from_Int32_Box_with_complexity,
51
ppl_new_Uint8_Box_from_Int64_Box, 50
ppl_new_Uint8_Box_from_Int64_Box_with_complexity,
51
ppl_new_Uint8_Box_from_Int8_Box, 50
ppl_new_Uint8_Box_from_Int8_Box_with_complexity,
51
ppl_new_Uint8_Box_from_Long_Double_Box,
51
ppl_new_Uint8_Box_from_Long_Double_Box_with_complexity,
53
ppl_new_Uint8_Box_from_NNC_Polyhedron,
51
ppl_new_Uint8_Box_from_NNC_Polyhedron_with_complexity,
52
ppl_new_Uint8_Box_from_Octagonal_Shape_double,
51
ppl_new_Uint8_Box_from_Octagonal_Shape_double_with_complexity,
53
ppl_new_Uint8_Box_from_Octagonal_Shape_float,
51
ppl_new_Uint8_Box_from_Octagonal_Shape_float_with_complexity,
53
ppl_new_Uint8_Box_from_Octagonal_Shape_int16_t,
51
ppl_new_Uint8_Box_from_Octagonal_Shape_int16_t_with_complexity,
52
ppl_new_Uint8_Box_from_Octagonal_Shape_int32_t,
51
ppl_new_Uint8_Box_from_Octagonal_Shape_int32_t_with_complexity,
52
ppl_new_Uint8_Box_from_Octagonal_Shape_int64_t,
51
ppl_new_Uint8_Box_from_Octagonal_Shape_int64_t_with_complexity,
52
ppl_new_Uint8_Box_from_Octagonal_Shape_int8_t,
51
ppl_new_Uint8_Box_from_Octagonal_Shape_int8_t_with_complexity,
52
ppl_new_Uint8_Box_from_Octagonal_Shape_long_double,
51
ppl_new_Uint8_Box_from_Octagonal_Shape_long_double_with_complexity,
53
ppl_new_Uint8_Box_from_Octagonal_Shape_mpq_class,
51
ppl_new_Uint8_Box_from_Octagonal_Shape_mpq_class_with_complexity,
52
ppl_new_Uint8_Box_from_Octagonal_Shape_mpz_class,
51
ppl_new_Uint8_Box_from_Octagonal_Shape_mpz_class_with_complexity,
52
ppl_new_Uint8_Box_from_Rational_Box,
50
ppl_new_Uint8_Box_from_Rational_Box_with_complexity,
52
ppl_new_Uint8_Box_from_space_dimension,
50
ppl_new_Uint8_Box_from_Uint16_Box,
50
ppl_new_Uint8_Box_from_Uint16_Box_with_complexity,
52
ppl_new_Uint8_Box_from_Uint32_Box,
50
ppl_new_Uint8_Box_from_Uint32_Box_with_complexity,
52
ppl_new_Uint8_Box_from_Uint64_Box,
50
ppl_new_Uint8_Box_from_Uint64_Box_with_complexity,
52
ppl_new_Uint8_Box_from_Uint8_Box, 50
ppl_new_Uint8_Box_from_Uint8_Box_with_complexity,
51
ppl_new_Uint8_Box_from_Z_Box, 50
ppl_new_Uint8_Box_from_Z_Box_with_complexity,
52
ppl_new_Uint8_Box_from_BD_Shape_double,
77
ppl_new_Uint8_Box_from_BD_Shape_double_with_complexity,
78
ppl_new_Uint8_Box_from_BD_Shape_float,
77
ppl_new_Uint8_Box_from_BD_Shape_float_with_complexity,
78

ppl_new_Z_Box_from_BD_Shape_int16_t, 76
ppl_new_Z_Box_from_BD_Shape_int16_t_with_complexity, 77
ppl_new_Z_Box_from_BD_Shape_int32_t, 76
ppl_new_Z_Box_from_BD_Shape_int32_t_with_complexity, 77
ppl_new_Z_Box_from_BD_Shape_int64_t, 76
ppl_new_Z_Box_from_BD_Shape_int64_t_with_complexity, 77
ppl_new_Z_Box_from_BD_Shape_int8_t, 76
ppl_new_Z_Box_from_BD_Shape_int8_t_with_complexity, 77
ppl_new_Z_Box_from_BD_Shape_long_double, 77
ppl_new_Z_Box_from_BD_Shape_long_double_with_complexity, 78
ppl_new_Z_Box_from_BD_Shape_mpq_class, 76
ppl_new_Z_Box_from_BD_Shape_mpq_class_with_complexity, 77
ppl_new_Z_Box_from_BD_Shape_mpz_class, 76
ppl_new_Z_Box_from_BD_Shape_mpz_class_with_complexity, 77
ppl_new_Z_Box_from_C_Polyhedron, 77
ppl_new_Z_Box_from_C_Polyhedron_with_complexity, 78
ppl_new_Z_Box_from_congruences, 78
ppl_new_Z_Box_from_constraints, 78
ppl_new_Z_Box_from_Double_Box, 77
ppl_new_Z_Box_from_Double_Box_with_complexity, 78
ppl_new_Z_Box_from_Float_Box, 77
ppl_new_Z_Box_from_Float_Box_with_complexity, 78
ppl_new_Z_Box_from_generators, 78
ppl_new_Z_Box_from_Grid, 77
ppl_new_Z_Box_from_Grid_with_complexity, 78
ppl_new_Z_Box_from_Int16_Box, 76
ppl_new_Z_Box_from_Int16_Box_with_complexity, 77
ppl_new_Z_Box_from_Int32_Box, 76
ppl_new_Z_Box_from_Int32_Box_with_complexity, 77
ppl_new_Z_Box_from_Int64_Box, 76
ppl_new_Z_Box_from_Int64_Box_with_complexity, 77
ppl_new_Z_Box_from_Int8_Box, 76
ppl_new_Z_Box_from_Int8_Box_with_complexity, 77
ppl_new_Z_Box_from_Long_Double_Box, 77
ppl_new_Z_Box_from_Long_Double_Box_with_complexit 78
ppl_new_Z_Box_from_NNC_Polyhedron, 77
ppl_new_Z_Box_from_NNC_Polyhedron_with_complexity 78
ppl_new_Z_Box_from_Octagonal_Shape_double, 77
ppl_new_Z_Box_from_Octagonal_Shape_double_with_co 78
ppl_new_Z_Box_from_Octagonal_Shape_float, 77
ppl_new_Z_Box_from_Octagonal_Shape_float_with_cor 78
ppl_new_Z_Box_from_Octagonal_Shape_int16_t, 76
ppl_new_Z_Box_from_Octagonal_Shape_int16_t_with_ 78
ppl_new_Z_Box_from_Octagonal_Shape_int32_t, 76
ppl_new_Z_Box_from_Octagonal_Shape_int32_t_with_ 78
ppl_new_Z_Box_from_Octagonal_Shape_int64_t, 76
ppl_new_Z_Box_from_Octagonal_Shape_int64_t_with_ 78
ppl_new_Z_Box_from_Octagonal_Shape_int8_t, 76
ppl_new_Z_Box_from_Octagonal_Shape_int8_t_with_co 78
ppl_new_Z_Box_from_Octagonal_Shape_long_double, 77
ppl_new_Z_Box_from_Octagonal_Shape_long_double_wi 78
ppl_new_Z_Box_from_Octagonal_Shape_mpq_class, 76
ppl_new_Z_Box_from_Octagonal_Shape_mpq_class_with 78
ppl_new_Z_Box_from_Octagonal_Shape_mpz_class, 76
ppl_new_Z_Box_from_Octagonal_Shape_mpz_class_with 78
ppl_new_Z_Box_from_Rational_Box, 76
ppl_new_Z_Box_from_Rational_Box_with_complexity, 77
ppl_new_Z_Box_from_space_dimension, 76
ppl_new_Z_Box_from_Uint16_Box, 76
ppl_new_Z_Box_from_Uint16_Box_with_complexity, 77

ppl_new_Z_Box_from_Uint32_Box, 76
ppl_new_Z_Box_from_Uint32_Box_with_complexity, 77
ppl_new_Z_Box_from_Uint64_Box, 76
ppl_new_Z_Box_from_Uint64_Box_with_complexity, 77
ppl_new_Z_Box_from_Uint8_Box, 76
ppl_new_Z_Box_from_Uint8_Box_with_complexity, 77
ppl_new_Z_Box_from_Z_Box, 76
ppl_new_Z_Box_from_Z_Box_with_complexity, 77
Ppl_ocaml, 19
ppl_Octagonal_Shape_double_add_congruence, 409
ppl_Octagonal_Shape_double_add_congruences, 409
ppl_Octagonal_Shape_double_add_constraint, 409
ppl_Octagonal_Shape_double_add_constraints, 409
ppl_Octagonal_Shape_double_add_space_dimensions_and_embed, 410
ppl_Octagonal_Shape_double_add_space_dimensions_and_project, 410
ppl_Octagonal_Shape_double_affine_dimension, 407
ppl_Octagonal_Shape_double_affine_image, 409
ppl_Octagonal_Shape_double_affine_preimage, 410
ppl_Octagonal_Shape_double_ascii_dump, 410
ppl_Octagonal_Shape_double_BHMZ05_widening_assign, 411
ppl_Octagonal_Shape_double_BHMZ05_widening_assign_with_tokens, 411
ppl_Octagonal_Shape_double_bounded_affine_image, 410
ppl_Octagonal_Shape_double_bounded_affine_preimage, 410
ppl_Octagonal_Shape_double_bounds_from_above, 408
ppl_Octagonal_Shape_double_bounds_from_below, 408
ppl_Octagonal_Shape_double_CC76_extrapolation_assign, 411
ppl_Octagonal_Shape_double_CC76_extrapolation_assign_with_tokens, 411
ppl_Octagonal_Shape_double_CC76_narrowing_assign, 411
ppl_Octagonal_Shape_double_concatenate_assign, 409
ppl_Octagonal_Shape_double_constrains, 409
ppl_Octagonal_Shape_double_contains_integer_point, 408
ppl_Octagonal_Shape_double_contains_Octagonal_Shape, 409
ppl_Octagonal_Shape_double_difference_assign, 409
ppl_Octagonal_Shape_double_drop_some_non_integer_points, 410
ppl_Octagonal_Shape_double_drop_some_non_integer_points, 410
ppl_Octagonal_Shape_double_equals_Octagonal_Shape, 409
ppl_Octagonal_Shape_double_expand_space_dimension, 410
ppl_Octagonal_Shape_double_external_memory_in_bytes, 410
ppl_Octagonal_Shape_double_fold_space_dimensions, 410
ppl_Octagonal_Shape_double_frequency, 408
ppl_Octagonal_Shape_double_generalized_affine_image, 410
ppl_Octagonal_Shape_double_generalized_affine_image_lhs_rhs, 410
ppl_Octagonal_Shape_double_generalized_affine_preimage, 410
ppl_Octagonal_Shape_double_generalized_affine_preimage_lhs_rhs, 410
ppl_Octagonal_Shape_double_get_congruences, 408
ppl_Octagonal_Shape_double_get_constraints, 408
ppl_Octagonal_Shape_double_get_minimized_congruences, 408
ppl_Octagonal_Shape_double_get_minimized_constraints, 408
ppl_Octagonal_Shape_double_intersection_assign, 409
ppl_Octagonal_Shape_double_is_bounded, 408
ppl_Octagonal_Shape_double_is_discrete, 408
ppl_Octagonal_Shape_double_is_disjoint_from_Octagonal_Shape, 409
ppl_Octagonal_Shape_double_is_empty, 408
ppl_Octagonal_Shape_double_is_topologically_closed, 408
ppl_Octagonal_Shape_double_is_universe, 408
ppl_Octagonal_Shape_double_limited_BHMZ05_extrapolation_assign, 411

ppl_Octagonal_Shape_double_limited_BHMZ05_extrapolation_assign_with_tokens, 411
ppl_Octagonal_Shape_double_limited_CC76_extrapolation_assign, 411
ppl_Octagonal_Shape_double_limited_CC76_extrapolation_assign_with_tokens, 411
ppl_Octagonal_Shape_double_linear_partition, 411
ppl_Octagonal_Shape_double_map_space_dimensions, 410
ppl_Octagonal_Shape_double_maximize, 408
ppl_Octagonal_Shape_double_maximize_with_point, 408
ppl_Octagonal_Shape_double_minimize, 408
ppl_Octagonal_Shape_double_minimize_with_point, 408
ppl_Octagonal_Shape_double_OK, 409
ppl_Octagonal_Shape_double_refine_with_congruence, 409
ppl_Octagonal_Shape_double_refine_with_congruences, 409
ppl_Octagonal_Shape_double_refine_with_constraint, 409
ppl_Octagonal_Shape_double_refine_with_constraints, 409
ppl_Octagonal_Shape_double_relation_with_congruence, 408
ppl_Octagonal_Shape_double_relation_with_constraint, 408
ppl_Octagonal_Shape_double_relation_with_generator, 408
ppl_Octagonal_Shape_double_remove_higher_space_dimensions, 410
ppl_Octagonal_Shape_double_remove_space_dimensions, 410
ppl_Octagonal_Shape_double_simplify_using_context_assign, 409
ppl_Octagonal_Shape_double_space_dimension, 407
ppl_Octagonal_Shape_double_strictly_contains, 409
ppl_Octagonal_Shape_double_swap, 407
ppl_Octagonal_Shape_double_time_elapse_assign, 409
ppl_Octagonal_Shape_double_topological_closure_assign, 408
ppl_Octagonal_Shape_double_total_memory_in_bytes, 410
ppl_Octagonal_Shape_double_unconstrain_space_dimension, 409
ppl_Octagonal_Shape_double_unconstrain_space_dimensions, 409
ppl_Octagonal_Shape_double_upper_bound_assign, 409
ppl_Octagonal_Shape_double_upper_bound_assign_if_exact, 409
ppl_Octagonal_Shape_double_widening_assign, 411
ppl_Octagonal_Shape_double_widening_assign_with_tokens, 411
ppl_Octagonal_Shape_double_wrap_assign, 411
ppl_Octagonal_Shape_float_add_congruence, 372
ppl_Octagonal_Shape_float_add_congruences, 372
ppl_Octagonal_Shape_float_add_constraint, 372
ppl_Octagonal_Shape_float_add_constraints, 372
ppl_Octagonal_Shape_float_add_space_dimensions_and_embed, 373
ppl_Octagonal_Shape_float_add_space_dimensions_and_project, 373
ppl_Octagonal_Shape_float_affine_dimension, 371
ppl_Octagonal_Shape_float_affine_image, 373
ppl_Octagonal_Shape_float_affine_preimage, 373
ppl_Octagonal_Shape_float_ascii_dump, 374
ppl_Octagonal_Shape_float_BHMZ05_widening_assign, 374
ppl_Octagonal_Shape_float_BHMZ05_widening_assign_with_tokens, 374
ppl_Octagonal_Shape_float_bounded_affine_image, 373
ppl_Octagonal_Shape_float_bounded_affine_preimage, 373
ppl_Octagonal_Shape_float_bounds_from_above, 371
ppl_Octagonal_Shape_float_bounds_from_below, 371
ppl_Octagonal_Shape_float_CC76_extrapolation_assign, 374
ppl_Octagonal_Shape_float_CC76_extrapolation_assign_with_tokens, 374
ppl_Octagonal_Shape_float_CC76_narrowing_assign, 374
ppl_Octagonal_Shape_float_concatenate_assign, 373
ppl_Octagonal_Shape_float_constrains, 373
ppl_Octagonal_Shape_float_contains_integer_point, 371

ppl_Octagonal_Shape_float_contains_Octagonal_Shape_float, 372
ppl_Octagonal_Shape_float_difference_assign, 372
ppl_Octagonal_Shape_float_drop_some_non_integer_dimensions, 374
ppl_Octagonal_Shape_float_drop_some_non_integer_dimensions_2, 374
ppl_Octagonal_Shape_float_equals_Octagonal_Shape_float, 372
ppl_Octagonal_Shape_float_expand_space_dimension, 374
ppl_Octagonal_Shape_float_external_memory_in_bytes, 374
ppl_Octagonal_Shape_float_fold_space_dimensions, 374
ppl_Octagonal_Shape_float_frequency, 372
ppl_Octagonal_Shape_float_generalized_affine_image, 373
ppl_Octagonal_Shape_float_generalized_affine_image_lhs_rhs, 373
ppl_Octagonal_Shape_float_generalized_affine_preimage, 373
ppl_Octagonal_Shape_float_generalized_affine_preimage_lhs_rhs, 373
ppl_Octagonal_Shape_float_get_congruences, 371
ppl_Octagonal_Shape_float_get_constraints, 371
ppl_Octagonal_Shape_float_get_minimized_congruences, 371
ppl_Octagonal_Shape_float_get_minimized_constraints, 371
ppl_Octagonal_Shape_float_intersection_assign, 372
ppl_Octagonal_Shape_float_is_bounded, 371
ppl_Octagonal_Shape_float_is_discrete, 371
ppl_Octagonal_Shape_float_is_disjoint_from_Octagonal_Shape_float, 372
ppl_Octagonal_Shape_float_is_empty, 371
ppl_Octagonal_Shape_float_is_topologically_closed, 371
ppl_Octagonal_Shape_float_is_universe, 371
ppl_Octagonal_Shape_float_limited_BHMZ05_extrapolation_assign, 374
ppl_Octagonal_Shape_float_limited_BHMZ05_extrapolation_assign_with_tokens, 374
ppl_Octagonal_Shape_float_limited_CC76_extrapolation_assign, 374
ppl_Octagonal_Shape_float_limited_CC76_extrapolation_assign_with_tokens, 374
ppl_Octagonal_Shape_float_linear_partition, 375
ppl_Octagonal_Shape_float_map_space_dimensions, 374
ppl_Octagonal_Shape_float_maximize, 372
ppl_Octagonal_Shape_float_maximize_with_point, 372
ppl_Octagonal_Shape_float_minimize, 372
ppl_Octagonal_Shape_float_minimize_with_point, 372
ppl_Octagonal_Shape_float_OK, 372
ppl_Octagonal_Shape_float_refine_with_congruence, 372
ppl_Octagonal_Shape_float_refine_with_congruences, 372
ppl_Octagonal_Shape_float_refine_with_constraint, 372
ppl_Octagonal_Shape_float_refine_with_constraints, 372
ppl_Octagonal_Shape_float_relation_with_congruence, 371
ppl_Octagonal_Shape_float_relation_with_constraint, 371
ppl_Octagonal_Shape_float_relation_with_generator, 371
ppl_Octagonal_Shape_float_remove_higher_space_dimensions, 374
ppl_Octagonal_Shape_float_remove_space_dimensions, 373
ppl_Octagonal_Shape_float_simplify_using_context_assign, 373
ppl_Octagonal_Shape_float_space_dimension, 371
ppl_Octagonal_Shape_float_strictly_contains_Octagonal_Shape_float, 372
ppl_Octagonal_Shape_float_swap, 371
ppl_Octagonal_Shape_float_time_elapse_assign, 373
ppl_Octagonal_Shape_float_topological_closure_assign, 371
ppl_Octagonal_Shape_float_total_memory_in_bytes, 374
ppl_Octagonal_Shape_float_unconstrain_space_dimension, 373
ppl_Octagonal_Shape_float_unconstrain_space_dimensions, 373
ppl_Octagonal_Shape_float_upper_bound_assign, 372
ppl_Octagonal_Shape_float_upper_bound_assign_if_exists, 373

ppl_Octagonal_Shape_float_widening_assign,
374
ppl_Octagonal_Shape_float_widening_assign_with_tokens,
374
ppl_Octagonal_Shape_float_wrap_assign,
375
ppl_Octagonal_Shape_int16_t_add_congruence,
150
ppl_Octagonal_Shape_int16_t_add_congruences,
150
ppl_Octagonal_Shape_int16_t_add_constraint,
150
ppl_Octagonal_Shape_int16_t_add_constraints,
150
ppl_Octagonal_Shape_int16_t_add_space_dimensions_and_embed,
151
ppl_Octagonal_Shape_int16_t_add_space_dimensions_and_project,
151
ppl_Octagonal_Shape_int16_t_affine_dimension,
148
ppl_Octagonal_Shape_int16_t_affine_image,
151
ppl_Octagonal_Shape_int16_t_affine_preimage,
151
ppl_Octagonal_Shape_int16_t_ascii_dump,
152
ppl_Octagonal_Shape_int16_t_BHMZ05_widening_assign,
152
ppl_Octagonal_Shape_int16_t_BHMZ05_widening_assign_with_tokens,
152
ppl_Octagonal_Shape_int16_t_bounded_affine_image,
151
ppl_Octagonal_Shape_int16_t_bounded_affine_preimage,
151
ppl_Octagonal_Shape_int16_t_bounds_from_above,
149
ppl_Octagonal_Shape_int16_t_bounds_from_below,
149
ppl_Octagonal_Shape_int16_t_CC76_extrapolation_assign,
152
ppl_Octagonal_Shape_int16_t_CC76_extrapolation_assign_with_tokens,
152
ppl_Octagonal_Shape_int16_t_CC76_narrowing_assign,
152
ppl_Octagonal_Shape_int16_t_concatenate_assign,
150
ppl_Octagonal_Shape_int16_t_constraints,
150
ppl_Octagonal_Shape_int16_t_contains_integer_point,
149
ppl_Octagonal_Shape_int16_t_contains_Octagonal_Shape_int16_t,
149
ppl_Octagonal_Shape_int16_t_difference_assign,
150
ppl_Octagonal_Shape_int16_t_drop_some_non_integer_points,
151
ppl_Octagonal_Shape_int16_t_drop_some_non_integer_points_with_tokens,
152
ppl_Octagonal_Shape_int16_t_equals_Octagonal_Shape_int16_t,
150
ppl_Octagonal_Shape_int16_t_expand_space_dimension,
151
ppl_Octagonal_Shape_int16_t_external_memory_in_bytes,
152
ppl_Octagonal_Shape_int16_t_fold_space_dimensions,
151
ppl_Octagonal_Shape_int16_t_frequency,
149
ppl_Octagonal_Shape_int16_t_generalized_affine_image,
151
ppl_Octagonal_Shape_int16_t_generalized_affine_image_lhs_rhs,
151
ppl_Octagonal_Shape_int16_t_generalized_affine_preimage,
151
ppl_Octagonal_Shape_int16_t_generalized_affine_preimage_lhs_rhs,
151
ppl_Octagonal_Shape_int16_t_get_congruences,
149
ppl_Octagonal_Shape_int16_t_get_constraints,
149
ppl_Octagonal_Shape_int16_t_get_minimized_congruences,
149
ppl_Octagonal_Shape_int16_t_get_minimized_constraints,
149
ppl_Octagonal_Shape_int16_t_intersection_assign,
150
ppl_Octagonal_Shape_int16_t_is_bounded,
149
ppl_Octagonal_Shape_int16_t_is_discrete,
149
ppl_Octagonal_Shape_int16_t_is_disjoint_from_Octagonal_Shape_int16_t,
150
ppl_Octagonal_Shape_int16_t_is_empty,
149
ppl_Octagonal_Shape_int16_t_is_topologically_closed,
149
ppl_Octagonal_Shape_int16_t_is_universe,
149
ppl_Octagonal_Shape_int16_t_limited_BHMZ05_extrapolation_assign,
152
ppl_Octagonal_Shape_int16_t_limited_BHMZ05_extrapolation_assign_with_tokens,
152
ppl_Octagonal_Shape_int16_t_limited_CC76_extrapolation_assign,
152
ppl_Octagonal_Shape_int16_t_limited_CC76_extrapolation_assign_with_tokens,
152
ppl_Octagonal_Shape_int16_t_linear_partition,
152

ppl_Octagonal_Shape_int16_t_map_space_dimensions, 151
ppl_Octagonal_Shape_int16_t_maximize, 149
ppl_Octagonal_Shape_int16_t_maximize_with_point, 149
ppl_Octagonal_Shape_int16_t_minimize, 149
ppl_Octagonal_Shape_int16_t_minimize_with_point, 149
ppl_Octagonal_Shape_int16_t_OK, 150
ppl_Octagonal_Shape_int16_t_refine_with_congruence, 150
ppl_Octagonal_Shape_int16_t_refine_with_congruences, 150
ppl_Octagonal_Shape_int16_t_refine_with_constraint, 150
ppl_Octagonal_Shape_int16_t_refine_with_constraints, 150
ppl_Octagonal_Shape_int16_t_relation_with_congruence, 149
ppl_Octagonal_Shape_int16_t_relation_with_constraint, 148
ppl_Octagonal_Shape_int16_t_relation_with_generator, 149
ppl_Octagonal_Shape_int16_t_remove_higher_space_dimensions, 151
ppl_Octagonal_Shape_int16_t_remove_space_dimensions, 151
ppl_Octagonal_Shape_int16_t_simplify_using_context_assign, 150
ppl_Octagonal_Shape_int16_t_space_dimension, 148
ppl_Octagonal_Shape_int16_t_strictly_contains, 150
ppl_Octagonal_Shape_int16_t_swap, 148
ppl_Octagonal_Shape_int16_t_time_elapse_assign, 150
ppl_Octagonal_Shape_int16_t_topological_closure_assign, 149
ppl_Octagonal_Shape_int16_t_total_memory_in_bytes, 152
ppl_Octagonal_Shape_int16_t_unconstrain_space_dimension, 151
ppl_Octagonal_Shape_int16_t_unconstrain_space_dimensions, 151
ppl_Octagonal_Shape_int16_t_upper_bound_assign, 150
ppl_Octagonal_Shape_int16_t_upper_bound_assign_if_exact, 150
ppl_Octagonal_Shape_int16_t_widening_assign, 152
ppl_Octagonal_Shape_int16_t_widening_assign_with_tokens, 152
ppl_Octagonal_Shape_int16_t_wrap_assign, 153
ppl_Octagonal_Shape_int32_t_add_congruence, 158
ppl_Octagonal_Shape_int32_t_add_congruences, 158
ppl_Octagonal_Shape_int32_t_add_constraint, 158
ppl_Octagonal_Shape_int32_t_add_constraints, 158
ppl_Octagonal_Shape_int32_t_add_space_dimensions, 160
ppl_Octagonal_Shape_int32_t_add_space_dimensions_and_embed, 160
ppl_Octagonal_Shape_int32_t_affine_dimension, 157
ppl_Octagonal_Shape_int32_t_affine_image, 159
ppl_Octagonal_Shape_int32_t_affine_preimage, 159
ppl_Octagonal_Shape_int32_t_ascii_dump, 160
ppl_Octagonal_Shape_int32_t_BHMZ05_widening_assign, 160
ppl_Octagonal_Shape_int32_t_BHMZ05_widening_assign_with_tokens, 160
ppl_Octagonal_Shape_int32_t_bounded_affine_image, 159
ppl_Octagonal_Shape_int32_t_bounded_affine_preimage, 159
ppl_Octagonal_Shape_int32_t_bounds_from_above, 158
ppl_Octagonal_Shape_int32_t_bounds_from_below, 158
ppl_Octagonal_Shape_int32_t_CC76_extrapolation_assign, 161
ppl_Octagonal_Shape_int32_t_CC76_extrapolation_assign_with_tokens, 161
ppl_Octagonal_Shape_int32_t_CC76_narrowing_assign, 161
ppl_Octagonal_Shape_int32_t_concatenate_assign, 159
ppl_Octagonal_Shape_int32_t_constrains, 159
ppl_Octagonal_Shape_int32_t_contains_integer_point, 158
ppl_Octagonal_Shape_int32_t_contains_Octagonal_Shape, 158
ppl_Octagonal_Shape_int32_t_difference_assign, 159
ppl_Octagonal_Shape_int32_t_drop_some_non_integer_points, 160
ppl_Octagonal_Shape_int32_t_drop_some_non_integer_points_with_tokens,

ppl_Octagonal_Shape_int32_t_equals_Octagonal_Shape_int32_t, 160
ppl_Octagonal_Shape_int32_t_expand_space_dimension, 158
ppl_Octagonal_Shape_int32_t_external_memory_in_bytes, 160
ppl_Octagonal_Shape_int32_t_fold_space_dimensions, 160
ppl_Octagonal_Shape_int32_t_frequency, 158
ppl_Octagonal_Shape_int32_t_generalized_affine_image, 160
ppl_Octagonal_Shape_int32_t_generalized_affine_image_lhs_rhs, 160
ppl_Octagonal_Shape_int32_t_generalized_affine_preimage, 160
ppl_Octagonal_Shape_int32_t_generalized_affine_preimage_lhs_rhs, 160
ppl_Octagonal_Shape_int32_t_get_congruences, 157
ppl_Octagonal_Shape_int32_t_get_constraints, 157
ppl_Octagonal_Shape_int32_t_get_minimized_congruences, 157
ppl_Octagonal_Shape_int32_t_get_minimized_constraints, 157
ppl_Octagonal_Shape_int32_t_intersection_assign, 159
ppl_Octagonal_Shape_int32_t_is_bounded, 157
ppl_Octagonal_Shape_int32_t_is_discrete, 158
ppl_Octagonal_Shape_int32_t_is_disjoint_from, 158
ppl_Octagonal_Shape_int32_t_is_empty, 157
ppl_Octagonal_Shape_int32_t_is_topologically_closed, 158
ppl_Octagonal_Shape_int32_t_is_universe, 157
ppl_Octagonal_Shape_int32_t_limited_BHMZ05_extrapolation_assign, 161
ppl_Octagonal_Shape_int32_t_limited_BHMZ05_extrapolation_assign_with_tokens, 161
ppl_Octagonal_Shape_int32_t_limited_CC76_extrapolation_assign, 161
ppl_Octagonal_Shape_int32_t_limited_CC76_extrapolation_assign_with_tokens, 161
ppl_Octagonal_Shape_int32_t_linear_partition, 161
ppl_Octagonal_Shape_int32_t_map_space_dimensions, 160
ppl_Octagonal_Shape_int32_t_maximize, 158
ppl_Octagonal_Shape_int32_t_maximize_with_point, 158
ppl_Octagonal_Shape_int32_t_minimize, 158
ppl_Octagonal_Shape_int32_t_minimize_with_point, 158
ppl_Octagonal_Shape_int32_t_OK, 158
ppl_Octagonal_Shape_int32_t_refine_with_congruenc
ppl_Octagonal_Shape_int32_t_refine_with_congruenc
ppl_Octagonal_Shape_int32_t_refine_with_constrain
ppl_Octagonal_Shape_int32_t_refine_with_constrain
ppl_Octagonal_Shape_int32_t_relation_with_congrue
ppl_Octagonal_Shape_int32_t_relation_with_constra
ppl_Octagonal_Shape_int32_t_relation_with_generat
ppl_Octagonal_Shape_int32_t_remove_higher_space_d
ppl_Octagonal_Shape_int32_t_remove_space_dimensio
ppl_Octagonal_Shape_int32_t_simplify_using_contex
ppl_Octagonal_Shape_int32_t_space_dimension,
ppl_Octagonal_Shape_int32_t_strictly_contains_Oct
ppl_Octagonal_Shape_int32_t_swap,
ppl_Octagonal_Shape_int32_t_time_elapse_assign,
ppl_Octagonal_Shape_int32_t_topological_closure_a
ppl_Octagonal_Shape_int32_t_total_memory_in_bytes
ppl_Octagonal_Shape_int32_t_unconstrain_space_dim
ppl_Octagonal_Shape_int32_t_unconstrain_space_dim
ppl_Octagonal_Shape_int32_t_upper_bound_assign,
ppl_Octagonal_Shape_int32_t_upper_bound_assign_if
ppl_Octagonal_Shape_int32_t_widening_assign,
ppl_Octagonal_Shape_int32_t_widening_assign_with_
ppl_Octagonal_Shape_int32_t_wrap_assign,

ppl_Octagonal_Shape_int64_t_add_congruence, 167
ppl_Octagonal_Shape_int64_t_add_congruences, 167
ppl_Octagonal_Shape_int64_t_add_constraint, 167
ppl_Octagonal_Shape_int64_t_add_constraints, 167
ppl_Octagonal_Shape_int64_t_add_space_dimensions_and_embed, 169
ppl_Octagonal_Shape_int64_t_add_space_dimensions_and_project, 169
ppl_Octagonal_Shape_int64_t_affine_dimension, 166
ppl_Octagonal_Shape_int64_t_affine_image, 168
ppl_Octagonal_Shape_int64_t_affine_preimage, 168
ppl_Octagonal_Shape_int64_t_ascii_dump, 169
ppl_Octagonal_Shape_int64_t_BHMZ05_widening_assign, 169
ppl_Octagonal_Shape_int64_t_BHMZ05_widening_assign_with_tokens, 169
ppl_Octagonal_Shape_int64_t_bounded_affine_image, 168
ppl_Octagonal_Shape_int64_t_bounded_affine_preimage, 168
ppl_Octagonal_Shape_int64_t_bounds_from_above, 166
ppl_Octagonal_Shape_int64_t_bounds_from_below, 166
ppl_Octagonal_Shape_int64_t_CC76_extrapolation_assign, 170
ppl_Octagonal_Shape_int64_t_CC76_extrapolation_assign_with_tokens, 170
ppl_Octagonal_Shape_int64_t_CC76_narrowing_assign, 170
ppl_Octagonal_Shape_int64_t_concatenate_assign, 168
ppl_Octagonal_Shape_int64_t_constraints, 168
ppl_Octagonal_Shape_int64_t_contains_integer_point, 166
ppl_Octagonal_Shape_int64_t_contains_Octagonal_Shape_int64_t, 167
ppl_Octagonal_Shape_int64_t_difference_assign, 168
ppl_Octagonal_Shape_int64_t_drop_some_non_integer_points, 169
ppl_Octagonal_Shape_int64_t_drop_some_non_integer_points_2, 169
ppl_Octagonal_Shape_int64_t_equals_Octagonal_Shape_int64_t, 167
ppl_Octagonal_Shape_int64_t_expand_space_dimension, 169
ppl_Octagonal_Shape_int64_t_external_memory_in_bytes, 169
ppl_Octagonal_Shape_int64_t_fold_space_dimensions, 169
ppl_Octagonal_Shape_int64_t_frequency, 167
ppl_Octagonal_Shape_int64_t_generalized_affine_image, 168
ppl_Octagonal_Shape_int64_t_generalized_affine_image_lhs_rhs, 168
ppl_Octagonal_Shape_int64_t_generalized_affine_preimage, 168
ppl_Octagonal_Shape_int64_t_generalized_affine_preimage_lhs_rhs, 168
ppl_Octagonal_Shape_int64_t_get_congruences, 166
ppl_Octagonal_Shape_int64_t_get_constraints, 166
ppl_Octagonal_Shape_int64_t_get_minimized_congruences, 166
ppl_Octagonal_Shape_int64_t_get_minimized_constraints, 166
ppl_Octagonal_Shape_int64_t_intersection_assign, 167
ppl_Octagonal_Shape_int64_t_is_bounded, 166
ppl_Octagonal_Shape_int64_t_is_discrete, 166
ppl_Octagonal_Shape_int64_t_is_disjoint_from_Octagonal_Shape_int64_t, 167
ppl_Octagonal_Shape_int64_t_is_empty, 166
ppl_Octagonal_Shape_int64_t_is_topologically_closed, 166
ppl_Octagonal_Shape_int64_t_is_universe, 166
ppl_Octagonal_Shape_int64_t_limited_BHMZ05_extrapolation_assign, 169
ppl_Octagonal_Shape_int64_t_limited_BHMZ05_extrapolation_assign_with_tokens, 169
ppl_Octagonal_Shape_int64_t_limited_CC76_extrapolation_assign, 170
ppl_Octagonal_Shape_int64_t_limited_CC76_extrapolation_assign_with_tokens, 169
ppl_Octagonal_Shape_int64_t_linear_partition, 170
ppl_Octagonal_Shape_int64_t_map_space_dimensions, 169
ppl_Octagonal_Shape_int64_t_maximize, 166
ppl_Octagonal_Shape_int64_t_maximize_with_point, 167

ppl_Octagonal_Shape_int64_t_minimize, 167
ppl_Octagonal_Shape_int64_t_minimize_with_point, 167
ppl_Octagonal_Shape_int64_t_OK, 167
ppl_Octagonal_Shape_int64_t_refine_with_congruence, 167
ppl_Octagonal_Shape_int64_t_refine_with_congruences, 167
ppl_Octagonal_Shape_int64_t_refine_with_constraint, 167
ppl_Octagonal_Shape_int64_t_refine_with_constraints, 167
ppl_Octagonal_Shape_int64_t_relation_with_congruence, 166
ppl_Octagonal_Shape_int64_t_relation_with_constraint, 166
ppl_Octagonal_Shape_int64_t_relation_with_generator, 166
ppl_Octagonal_Shape_int64_t_remove_higher_space_dimensions, 169
ppl_Octagonal_Shape_int64_t_remove_space_dimensions, 169
ppl_Octagonal_Shape_int64_t_simplify_using_context_assign, 168
ppl_Octagonal_Shape_int64_t_space_dimension, 166
ppl_Octagonal_Shape_int64_t_strictly_contains, 167
ppl_Octagonal_Shape_int64_t_swap, 166
ppl_Octagonal_Shape_int64_t_time_elapse_assign, 168
ppl_Octagonal_Shape_int64_t_topological_closure_assign, 166
ppl_Octagonal_Shape_int64_t_total_memory_in_bytes, 169
ppl_Octagonal_Shape_int64_t_unconstrain_space_dimension, 168
ppl_Octagonal_Shape_int64_t_unconstrain_space_dimensions, 168
ppl_Octagonal_Shape_int64_t_upper_bound_assign, 167
ppl_Octagonal_Shape_int64_t_upper_bound_assign_if_exact, 168
ppl_Octagonal_Shape_int64_t_widening_assign, 169
ppl_Octagonal_Shape_int64_t_widening_assign_with_tokens, 169
ppl_Octagonal_Shape_int64_t_wrap_assign, 170
ppl_Octagonal_Shape_int8_t_add_congruence, 141
ppl_Octagonal_Shape_int8_t_add_congruences, 142
ppl_Octagonal_Shape_int8_t_add_constraint, 141
ppl_Octagonal_Shape_int8_t_add_constraints, 141
ppl_Octagonal_Shape_int8_t_add_space_dimensions_a
ppl_Octagonal_Shape_int8_t_add_space_dimensions_a
ppl_Octagonal_Shape_int8_t_affine_dimension, 140
ppl_Octagonal_Shape_int8_t_affine_image, 142
ppl_Octagonal_Shape_int8_t_affine_preimage, 142
ppl_Octagonal_Shape_int8_t_ascii_dump, 143
ppl_Octagonal_Shape_int8_t_BHMZ05_widening_assign
ppl_Octagonal_Shape_int8_t_BHMZ05_widening_assign
ppl_Octagonal_Shape_int8_t_bounded_affine_image, 142
ppl_Octagonal_Shape_int8_t_bounded_affine_preimag
ppl_Octagonal_Shape_int8_t_bounds_from_above, 141
ppl_Octagonal_Shape_int8_t_bounds_from_below, 141
ppl_Octagonal_Shape_int8_t_CC76_extrapolation_ass
ppl_Octagonal_Shape_int8_t_CC76_extrapolation_ass
ppl_Octagonal_Shape_int8_t_CC76_narrowing_assign,
ppl_Octagonal_Shape_int8_t_concatenate_assign, 142
ppl_Octagonal_Shape_int8_t_constrains, 142
ppl_Octagonal_Shape_int8_t_contains_integer_point
ppl_Octagonal_Shape_int8_t_contains_Octagonal_Sha
ppl_Octagonal_Shape_int8_t_difference_assign, 142
ppl_Octagonal_Shape_int8_t_drop_some_non_integer_
ppl_Octagonal_Shape_int8_t_drop_some_non_integer_
ppl_Octagonal_Shape_int8_t_equals_Octagonal_Shape
ppl_Octagonal_Shape_int8_t_expand_space_dimensior
ppl_Octagonal_Shape_int8_t_external_memory_in_byt

143
ppl_Octagonal_Shape_int8_t_fold_space_dimensions,
143
ppl_Octagonal_Shape_int8_t_frequency,
141
ppl_Octagonal_Shape_int8_t_generalized_affine_image,
142
ppl_Octagonal_Shape_int8_t_generalized_affine_image_lhs_rhs,
143
ppl_Octagonal_Shape_int8_t_generalized_affine_preimage,
143
ppl_Octagonal_Shape_int8_t_generalized_affine_preimage_lhs_rhs,
143
ppl_Octagonal_Shape_int8_t_get_congruences, 140
ppl_Octagonal_Shape_int8_t_get_constraints, 140
ppl_Octagonal_Shape_int8_t_get_minimized_congruences,
141
ppl_Octagonal_Shape_int8_t_get_minimized_constraints,
140
ppl_Octagonal_Shape_int8_t_intersection_assign,
142
ppl_Octagonal_Shape_int8_t_is_bounded,
141
ppl_Octagonal_Shape_int8_t_is_discrete,
141
ppl_Octagonal_Shape_int8_t_is_disjoint_from_Octagonal_Shape_int8_t,
141
ppl_Octagonal_Shape_int8_t_is_empty,
141
ppl_Octagonal_Shape_int8_t_is_topologically_closed,
141
ppl_Octagonal_Shape_int8_t_is_universe,
141
ppl_Octagonal_Shape_int8_t_limited_BHMZ05_extrapolation_assign,
144
ppl_Octagonal_Shape_int8_t_limited_BHMZ05_extrapolation_assign_with_tokens,
143
ppl_Octagonal_Shape_int8_t_limited_CC76_extrapolation_assign,
144
ppl_Octagonal_Shape_int8_t_limited_CC76_extrapolation_assign_with_tokens,
144
ppl_Octagonal_Shape_int8_t_linear_partition,
144
ppl_Octagonal_Shape_int8_t_map_space_dimensions,
143
ppl_Octagonal_Shape_int8_t_maximize,
141
ppl_Octagonal_Shape_int8_t_maximize_with_point,
141
ppl_Octagonal_Shape_int8_t_minimize,
141
ppl_Octagonal_Shape_int8_t_minimize_with_point,
141
ppl_Octagonal_Shape_int8_t_OK, 141
ppl_Octagonal_Shape_int8_t_refine_with_congruence,
142
ppl_Octagonal_Shape_int8_t_refine_with_congruences,
142
ppl_Octagonal_Shape_int8_t_refine_with_constraint,
142
ppl_Octagonal_Shape_int8_t_refine_with_constraints,
142
ppl_Octagonal_Shape_int8_t_relation_with_congruence,
140
ppl_Octagonal_Shape_int8_t_relation_with_constraint,
140
ppl_Octagonal_Shape_int8_t_relation_with_generator,
140
ppl_Octagonal_Shape_int8_t_remove_higher_space_dimensions,
143
ppl_Octagonal_Shape_int8_t_remove_space_dimensions,
143
ppl_Octagonal_Shape_int8_t_simplify_using_context_assign,
142
ppl_Octagonal_Shape_int8_t_space_dimension,
140
ppl_Octagonal_Shape_int8_t_strictly_contains_Octagonal_Shape_int8_t,
141
ppl_Octagonal_Shape_int8_t_swap, 140
ppl_Octagonal_Shape_int8_t_time_elapse_assign,
142
ppl_Octagonal_Shape_int8_t_topological_closure_assign,
141
ppl_Octagonal_Shape_int8_t_total_memory_in_bytes,
143
ppl_Octagonal_Shape_int8_t_unconstrain_space_dimension,
142
ppl_Octagonal_Shape_int8_t_unconstrain_space_dimensions,
142
ppl_Octagonal_Shape_int8_t_upper_bound_assign,
142
ppl_Octagonal_Shape_int8_t_upper_bound_assign_if_exists,
142
ppl_Octagonal_Shape_int8_t_widening_assign,
143
ppl_Octagonal_Shape_int8_t_widening_assign_with_t
143
ppl_Octagonal_Shape_int8_t_wrap_assign,
144
ppl_Octagonal_Shape_long_double_add_congruence,
447
ppl_Octagonal_Shape_long_double_add_congruences,
447
ppl_Octagonal_Shape_long_double_add_constraint,
447
ppl_Octagonal_Shape_long_double_add_constraints,

447
ppl_Octagonal_Shape_long_double_add_space_dimensions_and_embed,
449
ppl_Octagonal_Shape_long_double_add_space_dimensions_and_project,
449
ppl_Octagonal_Shape_long_double_affine_dimension,
446
ppl_Octagonal_Shape_long_double_affine_image,
448
ppl_Octagonal_Shape_long_double_affine_preimage,
448
ppl_Octagonal_Shape_long_double_ascii_dump,
449
ppl_Octagonal_Shape_long_double_BHMZ05_widening_assign,
449
ppl_Octagonal_Shape_long_double_BHMZ05_widening_assign_with_tokens,
449
ppl_Octagonal_Shape_long_double_bounded_affine_image,
448
ppl_Octagonal_Shape_long_double_bounded_affine_preimage,
448
ppl_Octagonal_Shape_long_double_bounds_from_above,
446
ppl_Octagonal_Shape_long_double_bounds_from_below,
446
ppl_Octagonal_Shape_long_double_CC76_extrapolation_assign,
450
ppl_Octagonal_Shape_long_double_CC76_extrapolation_assign_with_tokens,
450
ppl_Octagonal_Shape_long_double_concatenate_assign,
448
ppl_Octagonal_Shape_long_double_constrains,
448
ppl_Octagonal_Shape_long_double_contains_integer_point,
446
ppl_Octagonal_Shape_long_double_contains_Octagonal_Shape_long_double,
447
ppl_Octagonal_Shape_long_double_difference_assign,
448
ppl_Octagonal_Shape_long_double_drop_some_dimensions,
449
ppl_Octagonal_Shape_long_double_drop_some_non_dimensions,
449
ppl_Octagonal_Shape_long_double_equals_Octagonal_Shape_long_double,
447
ppl_Octagonal_Shape_long_double_expand_space_dimension,
449
ppl_Octagonal_Shape_long_double_external_memory,
449
ppl_Octagonal_Shape_long_double_fold_space_dimensions,
449
ppl_Octagonal_Shape_long_double_frequency,
447
ppl_Octagonal_Shape_long_double_generalized_affine_image,
448
ppl_Octagonal_Shape_long_double_generalized_affine_image_lhs_rhs,
448
ppl_Octagonal_Shape_long_double_generalized_affine_preimage,
449
ppl_Octagonal_Shape_long_double_get_congruences,
446
ppl_Octagonal_Shape_long_double_get_constraints,
446
ppl_Octagonal_Shape_long_double_get_minimized_congruences,
446
ppl_Octagonal_Shape_long_double_get_minimized_constraints,
446
ppl_Octagonal_Shape_long_double_intersection_assign,
447
ppl_Octagonal_Shape_long_double_is_bounded,
446
ppl_Octagonal_Shape_long_double_is_discrete,
446
ppl_Octagonal_Shape_long_double_is_disjoint_from_Octagonal_Shape_long_double,
447
ppl_Octagonal_Shape_long_double_is_empty,
446
ppl_Octagonal_Shape_long_double_is_topologically_closed,
446
ppl_Octagonal_Shape_long_double_is_universe,
446
ppl_Octagonal_Shape_long_double_limited_BHMZ05_extrapolation_assign,
450
ppl_Octagonal_Shape_long_double_limited_BHMZ05_extrapolation_assign_with_tokens,
449
ppl_Octagonal_Shape_long_double_limited_CC76_extrapolation_assign,
450
ppl_Octagonal_Shape_long_double_limited_CC76_extrapolation_assign_with_tokens,
449
ppl_Octagonal_Shape_long_double_linear_partition,
450
ppl_Octagonal_Shape_long_double_map_space_dimensions,
449
ppl_Octagonal_Shape_long_double_maximize,
447
ppl_Octagonal_Shape_long_double_maximize_with_point,
447
ppl_Octagonal_Shape_long_double_minimize,
447
ppl_Octagonal_Shape_long_double_minimize_with_point,
447
ppl_Octagonal_Shape_long_double_OK,
447
ppl_Octagonal_Shape_long_double_refine_with_congruence,

ppl_Octagonal_Shape_long_double_refin 447
ppl_Octagonal_Shape_long_double_refin 447
ppl_Octagonal_Shape_long_double_refin 447
ppl_Octagonal_Shape_long_double_relat 447
ppl_Octagonal_Shape_long_double_relat 446
ppl_Octagonal_Shape_long_double_relat 446
ppl_Octagonal_Shape_long_double_relat 446
ppl_Octagonal_Shape_long_double_remov 449
ppl_Octagonal_Shape_long_double_remov 449
ppl_Octagonal_Shape_long_double_simpl 448
ppl_Octagonal_Shape_long_double_space 446
ppl_Octagonal_Shape_long_double_strict 447
ppl_Octagonal_Shape_long_double_swap 446
ppl_Octagonal_Shape_long_double_time_ 448
ppl_Octagonal_Shape_long_double_topol 446
ppl_Octagonal_Shape_long_double_total 449
ppl_Octagonal_Shape_long_double_uncon 448
ppl_Octagonal_Shape_long_double_uncon 448
ppl_Octagonal_Shape_long_double_upper 448
ppl_Octagonal_Shape_long_double_upper 448
ppl_Octagonal_Shape_long_double_widen 449
ppl_Octagonal_Shape_long_double_widen 449
ppl_Octagonal_Shape_long_double_wrapp 450
ppl_Octagonal_Shape_mpq_class_add_con 185
ppl_Octagonal_Shape_mpq_class_add_con 185
ppl_Octagonal_Shape_mpq_class_add_con 185
ppl_Octagonal_Shape_mpq_class_add_con 185
ppl_Octagonal_Shape_mpq_class_add_spa 186
ppl_Octagonal_Shape_mpq_class_add_spa 186
ppl_Octagonal_Shape_mpq_class_affine_ 186
ppl_Octagonal_Shape_mpq_class_affine_ 183
ppl_Octagonal_Shape_mpq_class_affine_ 185
ppl_Octagonal_Shape_mpq_class_affine_ 186
ppl_Octagonal_Shape_mpq_class_ascii_d 186
ppl_Octagonal_Shape_mpq_class_BHMZ05_ 186
ppl_Octagonal_Shape_mpq_class_BHMZ05_ 187
ppl_Octagonal_Shape_mpq_class_bounded 187
ppl_Octagonal_Shape_mpq_class_bounded 186
ppl_Octagonal_Shape_mpq_class_bounds_ 186
ppl_Octagonal_Shape_mpq_class_bounds_ 184
ppl_Octagonal_Shape_mpq_class_CC76_ex 184
ppl_Octagonal_Shape_mpq_class_CC76_ex 187
ppl_Octagonal_Shape_mpq_class_CC76_na 187
ppl_Octagonal_Shape_mpq_class_concate 187
ppl_Octagonal_Shape_mpq_class_constra 185
ppl_Octagonal_Shape_mpq_class_contain 185
ppl_Octagonal_Shape_mpq_class_contain 184
ppl_Octagonal_Shape_mpq_class_contain 184
ppl_Octagonal_Shape_mpq_class_differe 185
ppl_Octagonal_Shape_mpq_class_drop_so 186
ppl_Octagonal_Shape_mpq_class_drop_so 186
ppl_Octagonal_Shape_mpq_class_equals_ 184
ppl_Octagonal_Shape_mpq_class_expand_ 186
ppl_Octagonal_Shape_mpq_class_externa 186
ppl_Octagonal_Shape_mpq_class_fold_sp 186
ppl_Octagonal_Shape_mpq_class_frequen 184
ppl_Octagonal_Shape_mpq_class_general

ppl_Octagonal_Shape_mpq_class_generalized_affine_image_lhs_rhs, 186
ppl_Octagonal_Shape_mpq_class_generalized_affine_preimage, 186
ppl_Octagonal_Shape_mpq_class_generalized_affine_preimage_lhs_rhs, 186
ppl_Octagonal_Shape_mpq_class_get_congruences, 183
ppl_Octagonal_Shape_mpq_class_get_constraints, 183
ppl_Octagonal_Shape_mpq_class_get_minimized_congruences, 183
ppl_Octagonal_Shape_mpq_class_get_minimized_constraints, 184
ppl_Octagonal_Shape_mpq_class_intersection_assign, 183
ppl_Octagonal_Shape_mpq_class_is_bounded, 185
ppl_Octagonal_Shape_mpq_class_is_discrete, 184
ppl_Octagonal_Shape_mpq_class_is_disjoint_from_Octagonal_Shape_mpq_class, 184
ppl_Octagonal_Shape_mpq_class_is_empty, 184
ppl_Octagonal_Shape_mpq_class_is_topologically_closed, 184
ppl_Octagonal_Shape_mpq_class_is_universe, 184
ppl_Octagonal_Shape_mpq_class_limited_BHMZ05_extrapolation_assign, 187
ppl_Octagonal_Shape_mpq_class_limited_BHMZ05_extrapolation_assign_with_tokens, 187
ppl_Octagonal_Shape_mpq_class_limited_CC76_extrapolation_assign, 187
ppl_Octagonal_Shape_mpq_class_limited_CC76_extrapolation_assign_with_tokens, 187
ppl_Octagonal_Shape_mpq_class_linear_partition, 187
ppl_Octagonal_Shape_mpq_class_map_space_dimensions, 186
ppl_Octagonal_Shape_mpq_class_maximize, 184
ppl_Octagonal_Shape_mpq_class_maximize_with_point, 184
ppl_Octagonal_Shape_mpq_class_minimize, 184
ppl_Octagonal_Shape_mpq_class_minimize_with_point, 184
ppl_Octagonal_Shape_mpq_class_OK, 185
ppl_Octagonal_Shape_mpq_class_refine_with_congruence, 185
ppl_Octagonal_Shape_mpq_class_refine_with_congruences, 185
ppl_Octagonal_Shape_mpq_class_refine_with_constraint, 185
ppl_Octagonal_Shape_mpq_class_refine_with_constraints, 185
ppl_Octagonal_Shape_mpq_class_relation_with_congruence, 183
ppl_Octagonal_Shape_mpq_class_relation_with_constraint, 183
ppl_Octagonal_Shape_mpq_class_relation_with_generator, 183
ppl_Octagonal_Shape_mpq_class_remove_higher_space_dimensions, 186
ppl_Octagonal_Shape_mpq_class_remove_space_dimensions, 186
ppl_Octagonal_Shape_mpq_class_simplify_using_context_assign, 185
ppl_Octagonal_Shape_mpq_class_space_dimension, 183
ppl_Octagonal_Shape_mpq_class_strictly_contains_Octagonal_Shape_mpq_class, 183
ppl_Octagonal_Shape_mpq_class_time_elapse_assign, 185
ppl_Octagonal_Shape_mpq_class_topological_closure_assign, 184
ppl_Octagonal_Shape_mpq_class_total_memory_in_bytes, 186
ppl_Octagonal_Shape_mpq_class_unconstrain_space_dimension, 185
ppl_Octagonal_Shape_mpq_class_unconstrain_space_dimensions, 185
ppl_Octagonal_Shape_mpq_class_upper_bound_assign, 185
ppl_Octagonal_Shape_mpq_class_upper_bound_assign_with_tokens, 185
ppl_Octagonal_Shape_mpq_class_widening_assign, 187
ppl_Octagonal_Shape_mpq_class_widening_assign_with_tokens, 187
ppl_Octagonal_Shape_mpq_class_wrap_assign, 187
ppl_Octagonal_Shape_mpz_class_add_congruence, 176
ppl_Octagonal_Shape_mpz_class_add_congruences, 176
ppl_Octagonal_Shape_mpz_class_add_constraint, 176
ppl_Octagonal_Shape_mpz_class_add_constraints, 176
ppl_Octagonal_Shape_mpz_class_add_space_dimensions_and_embed, 177
ppl_Octagonal_Shape_mpz_class_add_space_dimensions_and_project, 177

ppl_Octagonal_Shape_mpz_class_affine_dimension, 177
ppl_Octagonal_Shape_mpz_class_affine_image, 174
ppl_Octagonal_Shape_mpz_class_affine_preimage, 177
ppl_Octagonal_Shape_mpz_class_ascii_dump, 177
ppl_Octagonal_Shape_mpz_class_BHMZ05_widening_assign, 178
ppl_Octagonal_Shape_mpz_class_BHMZ05_widening_assign_with_tokens, 178
ppl_Octagonal_Shape_mpz_class_bounded_affine_image, 178
ppl_Octagonal_Shape_mpz_class_bounded_affine_preimage, 177
ppl_Octagonal_Shape_mpz_class_bounds_from_above, 177
ppl_Octagonal_Shape_mpz_class_bounds_from_below, 175
ppl_Octagonal_Shape_mpz_class_CC76_extrapolation_assign, 175
ppl_Octagonal_Shape_mpz_class_CC76_extrapolation_assign_with_tokens, 178
ppl_Octagonal_Shape_mpz_class_CC76_narrowing_assign, 178
ppl_Octagonal_Shape_mpz_class_concatenate_assign, 178
ppl_Octagonal_Shape_mpz_class_constrains, 176
ppl_Octagonal_Shape_mpz_class_contains_integer_point, 177
ppl_Octagonal_Shape_mpz_class_contains_Octagonal_Shape_mpz_class, 175
ppl_Octagonal_Shape_mpz_class_difference_assign, 176
ppl_Octagonal_Shape_mpz_class_drop_some_non_integer_points, 176
ppl_Octagonal_Shape_mpz_class_drop_some_non_integer_points2, 178
ppl_Octagonal_Shape_mpz_class_equals_Octagonal_Shape_mpz_class, 178
ppl_Octagonal_Shape_mpz_class_expand_dimension, 176
ppl_Octagonal_Shape_mpz_class_external_memory_in_bytes, 177
ppl_Octagonal_Shape_mpz_class_fold_space_dimensions, 178
ppl_Octagonal_Shape_mpz_class_frequency, 177
ppl_Octagonal_Shape_mpz_class_generalized_affine_image, 175
ppl_Octagonal_Shape_mpz_class_generalized_affine_image_lhs_rhs, 177
ppl_Octagonal_Shape_mpz_class_generalized_affine_preimage, 174
ppl_Octagonal_Shape_mpz_class_generalized_affine_preimage_lhs_rhs, 177
ppl_Octagonal_Shape_mpz_class_get_congruences, 177
ppl_Octagonal_Shape_mpz_class_get_constraints, 177
ppl_Octagonal_Shape_mpz_class_get_minimized_congruences, 178
ppl_Octagonal_Shape_mpz_class_get_minimized_constraints, 178
ppl_Octagonal_Shape_mpz_class_intersection_assign, 177
ppl_Octagonal_Shape_mpz_class_is_bounded, 177
ppl_Octagonal_Shape_mpz_class_is_discrete, 175
ppl_Octagonal_Shape_mpz_class_is_disjoint_from_Octagonal_Shape_mpz_class, 175
ppl_Octagonal_Shape_mpz_class_is_empty, 178
ppl_Octagonal_Shape_mpz_class_is_topologically_closed, 178
ppl_Octagonal_Shape_mpz_class_is_universe, 178
ppl_Octagonal_Shape_mpz_class_limited_BHMZ05_extrapolation_assign, 176
ppl_Octagonal_Shape_mpz_class_limited_BHMZ05_extrapolation_assign_with_tokens, 177
ppl_Octagonal_Shape_mpz_class_limited_CC76_extrapolation_assign, 175
ppl_Octagonal_Shape_mpz_class_limited_CC76_extrapolation_assign_with_tokens, 176
ppl_Octagonal_Shape_mpz_class_linear_partition, 176
ppl_Octagonal_Shape_mpz_class_map_space_dimensions, 178
ppl_Octagonal_Shape_mpz_class_maximize, 178
ppl_Octagonal_Shape_mpz_class_maximize_with_point, 176
ppl_Octagonal_Shape_mpz_class_minimize, 177
ppl_Octagonal_Shape_mpz_class_minimize_with_point, 178
ppl_Octagonal_Shape_mpz_class_OK, 177
ppl_Octagonal_Shape_mpz_class_refine_with_congruence, 175
ppl_Octagonal_Shape_mpz_class_refine_with_congruence_lhs_rhs, 177
ppl_Octagonal_Shape_mpz_class_refine_with_constraint, 177
ppl_Octagonal_Shape_mpz_class_refine_with_constraint_lhs_rhs, 177
ppl_Octagonal_Shape_mpz_class_refine_with_constraints, 177
ppl_Octagonal_Shape_mpz_class_refine_with_constraints_lhs_rhs, 177
ppl_Octagonal_Shape_mpz_class_relation_with_congruence, 175
ppl_Octagonal_Shape_mpz_class_relation_with_constraint, 175
ppl_Octagonal_Shape_mpz_class_remove_dimensions, 176
ppl_Octagonal_Shape_mpz_class_remove_higher_dimensions, 176
ppl_Octagonal_Shape_mpz_class_remove_space_dimensions, 176
ppl_Octagonal_Shape_mpz_class_relation_with_constraint, 175
ppl_Octagonal_Shape_mpz_class_remove_dimensions, 176
ppl_Octagonal_Shape_mpz_class_remove_higher_dimensions, 176
ppl_Octagonal_Shape_mpz_class_remove_space_dimensions, 176
ppl_Octagonal_Shape_mpz_class_relation_with_congruence, 175
ppl_Octagonal_Shape_mpz_class_relation_with_constraint, 175
ppl_Octagonal_Shape_mpz_class_remove_dimensions, 176
ppl_Octagonal_Shape_mpz_class_remove_higher_dimensions, 176
ppl_Octagonal_Shape_mpz_class_remove_space_dimensions, 176

176
ppl_Octagonal_Shape_mpz_class_refine_with_transfer,
176
ppl_Octagonal_Shape_mpz_class_relation_with_constraint,
175
ppl_Octagonal_Shape_mpz_class_relation_with_generator,
174
ppl_Octagonal_Shape_mpz_class_remove_higher_dimensions,
175
ppl_Octagonal_Shape_mpz_class_remove_space_dimensions,
177
ppl_Octagonal_Shape_mpz_class_simplify_using_context,
177
ppl_Octagonal_Shape_mpz_class_space_dimension,
177
ppl_Octagonal_Shape_mpz_class_strictly_contains,
174
ppl_Octagonal_Shape_mpz_class_swap,
176
ppl_Octagonal_Shape_mpz_class_time_elapse_assign,
174
ppl_Octagonal_Shape_mpz_class_topology,
176
ppl_Octagonal_Shape_mpz_class_total_memory_in_bytes,
175
ppl_Octagonal_Shape_mpz_class_total_memory_in_bytes,
178
ppl_Octagonal_Shape_mpz_class_unconstrain_space_dimension,
177
ppl_Octagonal_Shape_mpz_class_unconstrain_space_dimensions,
177
ppl_Octagonal_Shape_mpz_class_upper_bound_assign,
176
ppl_Octagonal_Shape_mpz_class_upper_bound_assign_if_exact,
176
ppl_Octagonal_Shape_mpz_class_widening_assign,
178
ppl_Octagonal_Shape_mpz_class_widening_assign_with_tokens,
178
ppl_Octagonal_Shape_mpz_class_wrap_assign,
179
ppl_one_affine_ranking_function_MS_BD_Shape_double,
403
ppl_one_affine_ranking_function_MS_BD_Shape_double_2,
404
ppl_one_affine_ranking_function_MS_BD_Shape_float,
367
ppl_one_affine_ranking_function_MS_BD_Shape_float_2,
367
ppl_one_affine_ranking_function_MS_BD_Shape_int16,
104
ppl_one_affine_ranking_function_MS_BD_Shape_int16_2,
104
ppl_one_affine_ranking_function_MS_BD_Shape_int32,
112
ppl_one_affine_ranking_function_MS_BD_Shape_int32_2,
112
ppl_one_affine_ranking_function_MS_BD_Shape_int64,
120
ppl_one_affine_ranking_function_MS_BD_Shape_int64_2,
120
ppl_one_affine_ranking_function_MS_BD_Shape_int8,
96
ppl_one_affine_ranking_function_MS_BD_Shape_int8_2,
96
ppl_one_affine_ranking_function_MS_BD_Shape_long_double,
441
ppl_one_affine_ranking_function_MS_BD_Shape_long_double_2,
442
ppl_one_affine_ranking_function_MS_BD_Shape_mpq_class,
136
ppl_one_affine_ranking_function_MS_BD_Shape_mpq_class_2,
136
ppl_one_affine_ranking_function_MS_BD_Shape_mpz_class,
128
ppl_one_affine_ranking_function_MS_BD_Shape_mpz_class_2,
128
ppl_one_affine_ranking_function_MS_C_Polyhedron,
198
ppl_one_affine_ranking_function_MS_C_Polyhedron_2,
198
ppl_one_affine_ranking_function_MS_Double_Box,
395
ppl_one_affine_ranking_function_MS_Double_Box_2,
396
ppl_one_affine_ranking_function_MS_Float_Box,
359
ppl_one_affine_ranking_function_MS_Float_Box_2,
359
ppl_one_affine_ranking_function_MS_Grid,
205
ppl_one_affine_ranking_function_MS_Grid_2,
205
ppl_one_affine_ranking_function_MS_Int16_Box,
37
ppl_one_affine_ranking_function_MS_Int16_Box_2,
37
ppl_one_affine_ranking_function_MS_Int32_Box,
43
ppl_one_affine_ranking_function_MS_Int32_Box_2,
44
ppl_one_affine_ranking_function_MS_Int64_Box,
50
ppl_one_affine_ranking_function_MS_Int64_Box_2,
50
ppl_one_affine_ranking_function_MS_Int8_Box,
31
ppl_one_affine_ranking_function_MS_Int8_Box_2,

ppl_one_affine_ranking_function_MS_Lpq_Double_Box, 31
ppl_one_affine_ranking_function_MS_Lpq_Double_Box_2, 433
ppl_one_affine_ranking_function_MS_NNC_Polyhedron, 433
ppl_one_affine_ranking_function_MS_NNC_Polyhedron_2, 198
ppl_one_affine_ranking_function_MS_Opq_double, 199
ppl_one_affine_ranking_function_MS_Opq_double_2, 411
ppl_one_affine_ranking_function_MS_Opq_float, 412
ppl_one_affine_ranking_function_MS_Opq_float_2, 375
ppl_one_affine_ranking_function_MS_Opq_int16, 375
ppl_one_affine_ranking_function_MS_Opq_int16_2, 153
ppl_one_affine_ranking_function_MS_Opq_int32, 153
ppl_one_affine_ranking_function_MS_Opq_int32_2, 161
ppl_one_affine_ranking_function_MS_Opq_int64, 162
ppl_one_affine_ranking_function_MS_Opq_int64_2, 170
ppl_one_affine_ranking_function_MS_Opq_int8, 170
ppl_one_affine_ranking_function_MS_Opq_int8_2, 144
ppl_one_affine_ranking_function_MS_Opq_long_double, 144
ppl_one_affine_ranking_function_MS_Opq_long_double_2, 450
ppl_one_affine_ranking_function_MS_Opq_mpq_class, 451
ppl_one_affine_ranking_function_MS_Opq_mpq_class_2, 188
ppl_one_affine_ranking_function_MS_Opq_mpz_class, 188
ppl_one_affine_ranking_function_MS_Opq_mpz_class_2, 179
ppl_one_affine_ranking_function_MS_Rational_Box, 179
ppl_one_affine_ranking_function_MS_Rational_Box_2, 88
ppl_one_affine_ranking_function_MS_Uint16_Box, 88
ppl_one_affine_ranking_function_MS_Uint16_Box_2, 63
ppl_one_affine_ranking_function_MS_Uint32_Box, 63
ppl_one_affine_ranking_function_MS_Uint32_Box_2, 69
ppl_one_affine_ranking_function_MS_Uint64_Box, 69
ppl_one_affine_ranking_function_MS_Uint64_Box_2, 75
ppl_one_affine_ranking_function_MS_Uint8_Box, 76
ppl_one_affine_ranking_function_MS_Uint8_Box_2, 56
ppl_one_affine_ranking_function_MS_Z_Box, 56
ppl_one_affine_ranking_function_MS_Z_Box_2, 81
ppl_one_affine_ranking_function_PR_BD_Shape_double, 81
ppl_one_affine_ranking_function_PR_BD_Shape_double_2, 403
ppl_one_affine_ranking_function_PR_BD_Shape_float, 404
ppl_one_affine_ranking_function_PR_BD_Shape_float_2, 367
ppl_one_affine_ranking_function_PR_BD_Shape_int16, 367
ppl_one_affine_ranking_function_PR_BD_Shape_int16_2, 104
ppl_one_affine_ranking_function_PR_BD_Shape_int32, 104
ppl_one_affine_ranking_function_PR_BD_Shape_int32_2, 112
ppl_one_affine_ranking_function_PR_BD_Shape_int64, 112
ppl_one_affine_ranking_function_PR_BD_Shape_int64_2, 120
ppl_one_affine_ranking_function_PR_BD_Shape_int8, 120
ppl_one_affine_ranking_function_PR_BD_Shape_int8_2, 96
ppl_one_affine_ranking_function_PR_BD_Shape_long_double, 96
ppl_one_affine_ranking_function_PR_BD_Shape_long_double_2, 441
ppl_one_affine_ranking_function_PR_BD_Shape_mpq_class, 442
ppl_one_affine_ranking_function_PR_BD_Shape_mpq_class_2, 136
ppl_one_affine_ranking_function_PR_BD_Shape_mpz_class, 136
ppl_one_affine_ranking_function_PR_BD_Shape_mpz_class_2, 128
ppl_one_affine_ranking_function_PR_C_Polyhedron, 128
ppl_one_affine_ranking_function_PR_C_Polyhedron_2, 198

198
ppl_one_affine_ranking_function_PR_Double_Box,
396
ppl_one_affine_ranking_function_PR_Double_Box_2,
396
ppl_one_affine_ranking_function_PR_Float_Box,
359
ppl_one_affine_ranking_function_PR_Float_Box_2,
359
ppl_one_affine_ranking_function_PR_Grid,
205
ppl_one_affine_ranking_function_PR_Grid_2,
205
ppl_one_affine_ranking_function_PR_Int16_Box,
37
ppl_one_affine_ranking_function_PR_Int16_Box_2,
37
ppl_one_affine_ranking_function_PR_Int32_Box,
43
ppl_one_affine_ranking_function_PR_Int32_Box_2,
44
ppl_one_affine_ranking_function_PR_Int64_Box,
50
ppl_one_affine_ranking_function_PR_Int64_Box_2,
50
ppl_one_affine_ranking_function_PR_Int8_Box,
31
ppl_one_affine_ranking_function_PR_Int8_Box_2,
31
ppl_one_affine_ranking_function_PR_Long_Double_Box,
433
ppl_one_affine_ranking_function_PR_Long_Double_Box_2,
433
ppl_one_affine_ranking_function_PR_NNC_Polyhedron,
198
ppl_one_affine_ranking_function_PR_NNC_Polyhedron_2,
199
ppl_one_affine_ranking_function_PR_Octagonal_Shape_double,
411
ppl_one_affine_ranking_function_PR_Octagonal_Shape_double_2,
412
ppl_one_affine_ranking_function_PR_Octagonal_Shape_float,
375
ppl_one_affine_ranking_function_PR_Octagonal_Shape_float_2,
375
ppl_one_affine_ranking_function_PR_Octagonal_Shape_int16_t,
153
ppl_one_affine_ranking_function_PR_Octagonal_Shape_int16_t_2,
153
ppl_one_affine_ranking_function_PR_Octagonal_Shape_int32_t,
161
ppl_one_affine_ranking_function_PR_Octagonal_Shape_int32_t_2,
162
ppl_one_affine_ranking_function_PR_Octagonal_Shape_int64_t,
170
ppl_one_affine_ranking_function_PR_Octagonal_Shape_int64_t_2,
170
ppl_one_affine_ranking_function_PR_Octagonal_Shape_int8_t,
144
ppl_one_affine_ranking_function_PR_Octagonal_Shape_int8_t_2,
144
ppl_one_affine_ranking_function_PR_Octagonal_Shape_mpq_class,
450
ppl_one_affine_ranking_function_PR_Octagonal_Shape_mpz_class,
451
ppl_one_affine_ranking_function_PR_Octagonal_Shape_uint16_t,
188
ppl_one_affine_ranking_function_PR_Octagonal_Shape_uint16_t_2,
188
ppl_one_affine_ranking_function_PR_Octagonal_Shape_uint32_t,
179
ppl_one_affine_ranking_function_PR_Octagonal_Shape_uint32_t_2,
179
ppl_one_affine_ranking_function_PR_Octagonal_Shape_uint64_t,
88
ppl_one_affine_ranking_function_PR_Octagonal_Shape_uint64_t_2,
88
ppl_one_affine_ranking_function_PR_Octagonal_Shape_uint8_t,
63
ppl_one_affine_ranking_function_PR_Octagonal_Shape_uint8_t_2,
63
ppl_one_affine_ranking_function_PR_Rational_Box,
69
ppl_one_affine_ranking_function_PR_Rational_Box_2,
69
ppl_one_affine_ranking_function_PR_Uint16_Box,
75
ppl_one_affine_ranking_function_PR_Uint16_Box_2,
76
ppl_one_affine_ranking_function_PR_Uint32_Box,
56
ppl_one_affine_ranking_function_PR_Uint32_Box_2,
56
ppl_one_affine_ranking_function_PR_Uint64_Box,
81
ppl_one_affine_ranking_function_PR_Uint64_Box_2,
82
ppl_one_affine_ranking_function_PR_Uint8_Box,
ppl_one_affine_ranking_function_PR_Uint8_Box_2,
ppl_one_affine_ranking_function_PR_Z_Box,
ppl_one_affine_ranking_function_PR_Z_Box_2,
ppl_PIP_Problem_add_constraint, 23
ppl_PIP_Problem_add_constraints, 23
ppl_PIP_Problem_add_space_dimensions_and_embed, 23
ppl_PIP_Problem_add_to_parameter_space_dimensions, 23
ppl_PIP_Problem_ascii_dump, 23
ppl_PIP_Problem_clear, 23
ppl_PIP_Problem_constraints, 23
ppl_PIP_Problem_get_big_parameter_dimension, 23

ppl_PIP_Problem_get_control_parameter, 23
ppl_PIP_Problem_has_big_parameter_dimension, 23
ppl_PIP_Problem_is_satisfiable, 23
ppl_PIP_Problem_OK, 23
ppl_PIP_Problem_optimizing_solution, 23
ppl_PIP_Problem_parameter_space_dimensions, 23
ppl_PIP_Problem_set_big_parameter_dimension, 23
ppl_PIP_Problem_set_control_parameter, 23
ppl_PIP_Problem_solution, 23
ppl_PIP_Problem_solve, 23
ppl_PIP_Problem_space_dimension, 23
ppl_PIP_Problem_swap, 23
ppl_PIP_Tree_Node_artificials, 23
ppl_PIP_Tree_Node_ascii_dump, 23
ppl_PIP_Tree_Node_constraints, 23
ppl_PIP_Tree_Node_false_child, 24
ppl_PIP_Tree_Node_is_bottom, 23
ppl_PIP_Tree_Node_is_decision, 24
ppl_PIP_Tree_Node_is_solution, 23
ppl_PIP_Tree_Node_OK, 23
ppl_PIP_Tree_Node_parametric_values, 24
ppl_PIP_Tree_Node_true_child, 24
ppl_Pointset_Powerset_BD_Shape_double_add_congruence, 418
ppl_Pointset_Powerset_BD_Shape_double_add_congruences, 419
ppl_Pointset_Powerset_BD_Shape_double_add_constraint, 418
ppl_Pointset_Powerset_BD_Shape_double_add_constraints, 418
ppl_Pointset_Powerset_BD_Shape_double_add_disjunct, 421
ppl_Pointset_Powerset_BD_Shape_double_add_space_dimensions_and_embed, 420
ppl_Pointset_Powerset_BD_Shape_double_add_space_dimensions_and_project, 420
ppl_Pointset_Powerset_BD_Shape_double_affine_dimension, 417
ppl_Pointset_Powerset_BD_Shape_double_affine_image, 419
ppl_Pointset_Powerset_BD_Shape_double_affine_preimage, 419
ppl_Pointset_Powerset_BD_Shape_double_ascii_dump, 420
ppl_Pointset_Powerset_BD_Shape_double_begin_iterator, 421
ppl_Pointset_Powerset_BD_Shape_double_BGP99_BHMZ, 421
ppl_Pointset_Powerset_BD_Shape_double_BGP99_H79_, 421
ppl_Pointset_Powerset_BD_Shape_double_BHZ03_H79_, 421
ppl_Pointset_Powerset_BD_Shape_double_BHZ03_H79_, 421
ppl_Pointset_Powerset_BD_Shape_double_bounded_af, 419
ppl_Pointset_Powerset_BD_Shape_double_bounded_af, 420
ppl_Pointset_Powerset_BD_Shape_double_bounds_fro, 418
ppl_Pointset_Powerset_BD_Shape_double_bounds_fro, 418
ppl_Pointset_Powerset_BD_Shape_double_concatenate, 419
ppl_Pointset_Powerset_BD_Shape_double_constrains, 419
ppl_Pointset_Powerset_BD_Shape_double_contains_i, 417
ppl_Pointset_Powerset_BD_Shape_double_contains_Po, 418
ppl_Pointset_Powerset_BD_Shape_double_decrement_, 421
ppl_Pointset_Powerset_BD_Shape_double_difference, 419
ppl_Pointset_Powerset_BD_Shape_double_drop_disju, 421
ppl_Pointset_Powerset_BD_Shape_double_drop_disju, 421
ppl_Pointset_Powerset_BD_Shape_double_drop_some_, 420
ppl_Pointset_Powerset_BD_Shape_double_drop_some_, 420
ppl_Pointset_Powerset_BD_Shape_double_end_iterato, 421
ppl_Pointset_Powerset_BD_Shape_double_equals_Poi, 418
ppl_Pointset_Powerset_BD_Shape_double_expand_spac, 420
ppl_Pointset_Powerset_BD_Shape_double_external_me, 420
ppl_Pointset_Powerset_BD_Shape_double_fold_space_, 420
ppl_Pointset_Powerset_BD_Shape_double_generalized, 420
ppl_Pointset_Powerset_BD_Shape_double_generalized, 420
ppl_Pointset_Powerset_BD_Shape_double_generalized, 420
ppl_Pointset_Powerset_BD_Shape_double_generalized, 420

ppl_Pointset_Powerset_BD_Shape_double, 418
ppl_Pointset_Powerset_BD_Shape_double, 418
ppl_Pointset_Powerset_BD_Shape_double, 421
ppl_Pointset_Powerset_BD_Shape_double, 421
ppl_Pointset_Powerset_BD_Shape_double, 419
ppl_Pointset_Powerset_BD_Shape_double, 417
ppl_Pointset_Powerset_BD_Shape_double, 417
ppl_Pointset_Powerset_BD_Shape_double, 418
ppl_Pointset_Powerset_BD_Shape_double, 417
ppl_Pointset_Powerset_BD_Shape_double, 417
ppl_Pointset_Powerset_BD_Shape_double, 417
ppl_Pointset_Powerset_BD_Shape_double, 421
ppl_Pointset_Powerset_BD_Shape_double, 420
ppl_Pointset_Powerset_BD_Shape_double, 418
ppl_Pointset_Powerset_BD_Shape_double, 418
ppl_Pointset_Powerset_BD_Shape_double, 418
ppl_Pointset_Powerset_BD_Shape_double, 418
ppl_Pointset_Powerset_BD_Shape_double, 417
ppl_Pointset_Powerset_BD_Shape_double, 419
ppl_Pointset_Powerset_BD_Shape_double, 419
ppl_Pointset_Powerset_BD_Shape_double, 419
ppl_Pointset_Powerset_BD_Shape_double, 417
ppl_Pointset_Powerset_BD_Shape_double, 417
ppl_Pointset_Powerset_BD_Shape_double, 417
ppl_Pointset_Powerset_BD_Shape_double, 420
ppl_Pointset_Powerset_BD_Shape_double, 420
ppl_Pointset_Powerset_BD_Shape_double, 419
ppl_Pointset_Powerset_BD_Shape_double, 417
ppl_Pointset_Powerset_BD_Shape_double, 419
ppl_Pointset_Powerset_BD_Shape_double, 419
ppl_Pointset_Powerset_BD_Shape_double, 419
ppl_Pointset_Powerset_BD_Shape_double, 417
ppl_Pointset_Powerset_BD_Shape_double, 417
ppl_Pointset_Powerset_BD_Shape_double, 417
ppl_Pointset_Powerset_BD_Shape_double, 420
ppl_Pointset_Powerset_BD_Shape_double, 419
ppl_Pointset_Powerset_BD_Shape_double, 419
ppl_Pointset_Powerset_BD_Shape_double, 418
ppl_Pointset_Powerset_BD_Shape_float, 382
ppl_Pointset_Powerset_BD_Shape_float, 382
ppl_Pointset_Powerset_BD_Shape_float, 382
ppl_Pointset_Powerset_BD_Shape_float, 382
ppl_Pointset_Powerset_BD_Shape_float, 384
ppl_Pointset_Powerset_BD_Shape_float, 383
ppl_Pointset_Powerset_BD_Shape_float, 383
ppl_Pointset_Powerset_BD_Shape_float, 380
ppl_Pointset_Powerset_BD_Shape_float, 383
ppl_Pointset_Powerset_BD_Shape_float, 383
ppl_Pointset_Powerset_BD_Shape_float, 384
ppl_Pointset_Powerset_BD_Shape_float, 384
ppl_Pointset_Powerset_BD_Shape_float, 385

ppl_Pointset_Powerset_BD_Shape_float_add_space_dimensions_and_embed, 385
ppl_Pointset_Powerset_BD_Shape_float_add_space_dimensions_and_project, 384
ppl_Pointset_Powerset_BD_Shape_float_affine_image, 384
ppl_Pointset_Powerset_BD_Shape_float_affine_preimage, 383
ppl_Pointset_Powerset_BD_Shape_float_ascii_dump, 383
ppl_Pointset_Powerset_BD_Shape_float_ascii_load, 381
ppl_Pointset_Powerset_BD_Shape_float_bounded_affine_image, 383
ppl_Pointset_Powerset_BD_Shape_float_bounded_affine_preimage, 381
ppl_Pointset_Powerset_BD_Shape_float_bounded_difference, 381
ppl_Pointset_Powerset_BD_Shape_float_bounded_difference_assign, 382
ppl_Pointset_Powerset_BD_Shape_float_concatenate_assign, 383
ppl_Pointset_Powerset_BD_Shape_float_constrains, 381
ppl_Pointset_Powerset_BD_Shape_float_contains_integer_point, 381
ppl_Pointset_Powerset_BD_Shape_float_contains_Powerset_BD_Shape_float, 384
ppl_Pointset_Powerset_BD_Shape_float_difference_assign, 382
ppl_Pointset_Powerset_BD_Shape_float_drop_some_non_integer_points, 384
ppl_Pointset_Powerset_BD_Shape_float_drop_some_non_integer_points_2, 384
ppl_Pointset_Powerset_BD_Shape_float_equals_Powerset_BD_Shape_float, 381
ppl_Pointset_Powerset_BD_Shape_float_expand_space_dimension, 383
ppl_Pointset_Powerset_BD_Shape_float_external_memory_in_bytes, 384
ppl_Pointset_Powerset_BD_Shape_float_fold_space_dimensions, 383
ppl_Pointset_Powerset_BD_Shape_float_generalized_affine_image, 383
ppl_Pointset_Powerset_BD_Shape_float_generalized_affine_image_lhs_rhs, 383
ppl_Pointset_Powerset_BD_Shape_float_generalized_affine_preimage, 383
ppl_Pointset_Powerset_BD_Shape_float_generalized_affine_preimage_lhs_rhs, 383
ppl_Pointset_Powerset_BD_Shape_float_geometrically_covers_Powerset_BD_Shape_float, 381
ppl_Pointset_Powerset_BD_Shape_float_get_disjunct, 384
ppl_Pointset_Powerset_BD_Shape_float_increment_iterator, 384
ppl_Pointset_Powerset_BD_Shape_float_intersection_assign, 382
ppl_Pointset_Powerset_BD_Shape_float_is_bounded, 381
ppl_Pointset_Powerset_BD_Shape_float_is_discrete, 381
ppl_Pointset_Powerset_BD_Shape_float_is_disjoint, 381
ppl_Pointset_Powerset_BD_Shape_float_is_empty, 380
ppl_Pointset_Powerset_BD_Shape_float_is_topologically_closed, 381
ppl_Pointset_Powerset_BD_Shape_float_is_universe, 380
ppl_Pointset_Powerset_BD_Shape_float_iterator_equals_iterator, 384
ppl_Pointset_Powerset_BD_Shape_float_map_space_dimensions, 383
ppl_Pointset_Powerset_BD_Shape_float_maximize, 381
ppl_Pointset_Powerset_BD_Shape_float_maximize_with_witness, 381
ppl_Pointset_Powerset_BD_Shape_float_minimize, 381
ppl_Pointset_Powerset_BD_Shape_float_minimize_with_witness, 381
ppl_Pointset_Powerset_BD_Shape_float_OK, 382
ppl_Pointset_Powerset_BD_Shape_float_omega_reduce, 381
ppl_Pointset_Powerset_BD_Shape_float_pairwise_reduce, 381
ppl_Pointset_Powerset_BD_Shape_float_refine_with_constraint, 382
ppl_Pointset_Powerset_BD_Shape_float_refine_with_constraints, 382
ppl_Pointset_Powerset_BD_Shape_float_refine_with_congruence, 382
ppl_Pointset_Powerset_BD_Shape_float_refine_with_congruences, 382
ppl_Pointset_Powerset_BD_Shape_float_relation_with_constraint, 380
ppl_Pointset_Powerset_BD_Shape_float_relation_with_congruence, 380
ppl_Pointset_Powerset_BD_Shape_float_relation_with_generator, 380
ppl_Pointset_Powerset_BD_Shape_float_remove_higher_dimensions, 383

ppl_Pointset_Powerset_BD_Shape_float ppl_Pointset_Powerset_BD_Shape_int16_t_BHZ03_H79 383
ppl_Pointset_Powerset_BD_Shape_float ppl_Pointset_Powerset_BD_Shape_int16_t_BHZ03_H79 382
ppl_Pointset_Powerset_BD_Shape_float ppl_Pointset_Powerset_BD_Shape_int16_t_bounded_a 384
ppl_Pointset_Powerset_BD_Shape_float ppl_Pointset_Powerset_BD_Shape_int16_t_bounded_a 380
ppl_Pointset_Powerset_BD_Shape_float ppl_Pointset_Powerset_BD_Shape_int16_t_bounds_fro 381
ppl_Pointset_Powerset_BD_Shape_float ppl_Pointset_Powerset_BD_Shape_int16_t_bounds_fro 380
ppl_Pointset_Powerset_BD_Shape_float ppl_Pointset_Powerset_BD_Shape_int16_t_concatenat 382
ppl_Pointset_Powerset_BD_Shape_float ppl_Pointset_Powerset_BD_Shape_int16_t_constrains 381
ppl_Pointset_Powerset_BD_Shape_float ppl_Pointset_Powerset_BD_Shape_int16_t_contains_ 384
ppl_Pointset_Powerset_BD_Shape_float ppl_Pointset_Powerset_BD_Shape_int16_t_contains_ 383
ppl_Pointset_Powerset_BD_Shape_float ppl_Pointset_Powerset_BD_Shape_int16_t_decrement_ 383
ppl_Pointset_Powerset_BD_Shape_float ppl_Pointset_Powerset_BD_Shape_int16_t_difference 382
ppl_Pointset_Powerset_BD_Shape_float ppl_Pointset_Powerset_BD_Shape_int16_t_drop_disju 382
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_drop_disju 256
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_drop_some_ 256
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_drop_some_ 256
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_end_iterat 256
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_equals_Po 259
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_expand_spa 258
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_external_ 258
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_fold_space 255
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_generalize 257
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_generalize 257
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_generalize 258
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_generalize 258
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_geometrica 259
ppl_Pointset_Powerset_BD_Shape_int16 ppl_Pointset_Powerset_BD_Shape_int16_t_geometrica 259

ppl_Pointset_Powerset_BD_Shape_int16_t_simplify_u 259
ppl_Pointset_Powerset_BD_Shape_int16_t_size, 258
ppl_Pointset_Powerset_BD_Shape_int16_t_space_dime 256
ppl_Pointset_Powerset_BD_Shape_int16_t_strictly_c 255
ppl_Pointset_Powerset_BD_Shape_int16_t_swap, 255
ppl_Pointset_Powerset_BD_Shape_int16_t_topologica 255
ppl_Pointset_Powerset_BD_Shape_int16_t_total_memo 255
ppl_Pointset_Powerset_BD_Shape_int16_t_unconstra 255
ppl_Pointset_Powerset_BD_Shape_int16_t_unconstra 258
ppl_Pointset_Powerset_BD_Shape_int16_t_upper_boun 258
ppl_Pointset_Powerset_BD_Shape_int16_t_upper_boun 255
ppl_Pointset_Powerset_BD_Shape_int32_t_add_congru 255
ppl_Pointset_Powerset_BD_Shape_int32_t_add_congru 255
ppl_Pointset_Powerset_BD_Shape_int32_t_add_consti 256
ppl_Pointset_Powerset_BD_Shape_int32_t_add_consti 256
ppl_Pointset_Powerset_BD_Shape_int32_t_add_disjun 255
ppl_Pointset_Powerset_BD_Shape_int32_t_add_space_ 255
ppl_Pointset_Powerset_BD_Shape_int32_t_add_space_ 256
ppl_Pointset_Powerset_BD_Shape_int32_t_affine_dir 256
ppl_Pointset_Powerset_BD_Shape_int32_t_affine_ima 256
ppl_Pointset_Powerset_BD_Shape_int32_t_affine_pre 256
ppl_Pointset_Powerset_BD_Shape_int32_t_ascii_dump 255
ppl_Pointset_Powerset_BD_Shape_int32_t_begin_iter 255
ppl_Pointset_Powerset_BD_Shape_int32_t_BGP99_BHMZ 255
ppl_Pointset_Powerset_BD_Shape_int32_t_BGP99_H79_ 258
ppl_Pointset_Powerset_BD_Shape_int32_t_BHZ03_H79_ 258

ppl_Pointset_Powerset_BD_Shape_int16_t_simplify_u 257
ppl_Pointset_Powerset_BD_Shape_int16_t_size, 258
ppl_Pointset_Powerset_BD_Shape_int16_t_space_dime 255
ppl_Pointset_Powerset_BD_Shape_int16_t_strictly_c 256
ppl_Pointset_Powerset_BD_Shape_int16_t_swap, 254
ppl_Pointset_Powerset_BD_Shape_int16_t_topologica 255
ppl_Pointset_Powerset_BD_Shape_int16_t_total_memo 258
ppl_Pointset_Powerset_BD_Shape_int16_t_unconstra 257
ppl_Pointset_Powerset_BD_Shape_int16_t_unconstra 257
ppl_Pointset_Powerset_BD_Shape_int16_t_upper_boun 257
ppl_Pointset_Powerset_BD_Shape_int16_t_upper_boun 257
ppl_Pointset_Powerset_BD_Shape_int32_t_add_congru 261
ppl_Pointset_Powerset_BD_Shape_int32_t_add_congru 261
ppl_Pointset_Powerset_BD_Shape_int32_t_add_consti 261
ppl_Pointset_Powerset_BD_Shape_int32_t_add_consti 261
ppl_Pointset_Powerset_BD_Shape_int32_t_add_disjun 263
ppl_Pointset_Powerset_BD_Shape_int32_t_add_space_ 262
ppl_Pointset_Powerset_BD_Shape_int32_t_add_space_ 263
ppl_Pointset_Powerset_BD_Shape_int32_t_affine_dir 259
ppl_Pointset_Powerset_BD_Shape_int32_t_affine_ima 262
ppl_Pointset_Powerset_BD_Shape_int32_t_affine_pre 262
ppl_Pointset_Powerset_BD_Shape_int32_t_ascii_dump 263
ppl_Pointset_Powerset_BD_Shape_int32_t_begin_iter 263
ppl_Pointset_Powerset_BD_Shape_int32_t_BGP99_BHMZ 264
ppl_Pointset_Powerset_BD_Shape_int32_t_BGP99_H79_ 264
ppl_Pointset_Powerset_BD_Shape_int32_t_BHZ03_H79_ 264

ppl_Pointset_Powerset_BD_Shape_int32_t_increment, 263
ppl_Pointset_Powerset_BD_Shape_int32_t_intersect, 261
ppl_Pointset_Powerset_BD_Shape_int32_t_is_bounded, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_is_discrete, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_is_disjoint, 261
ppl_Pointset_Powerset_BD_Shape_int32_t_is_empty, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_is_topologically_closed, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_is_universe, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_map_space_dimensions, 263
ppl_Pointset_Powerset_BD_Shape_int32_t_maximize, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_maximize_with_witness, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_minimize, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_minimize_with_witness, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_OK, 261
ppl_Pointset_Powerset_BD_Shape_int32_t_omega_reduce, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_pairwise_reduce, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_refine_with_congruence, 261
ppl_Pointset_Powerset_BD_Shape_int32_t_refine_with_congruences, 261
ppl_Pointset_Powerset_BD_Shape_int32_t_refine_with_constraint, 261
ppl_Pointset_Powerset_BD_Shape_int32_t_refine_with_constraints, 261
ppl_Pointset_Powerset_BD_Shape_int32_t_relation_with_congruence, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_relation_with_constraint, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_relation_with_constraints, 260
ppl_Pointset_Powerset_BD_Shape_int32_t_remove_higher_dimensions, 263
ppl_Pointset_Powerset_BD_Shape_int32_t_remove_space_dimensions, 263
ppl_Pointset_Powerset_BD_Shape_int32_t_simplify_using_context_assign, 262

ppl_Pointset_Powerset_BD_Shape_int32_ppl_Pointset_Powerset_BD_Shape_int64_t_bounded_a
263 267
ppl_Pointset_Powerset_BD_Shape_int32_ppl_Pointset_Powerset_BD_Shape_int64_t_bounded_a
259 267
ppl_Pointset_Powerset_BD_Shape_int32_ppl_Pointset_Powerset_BD_Shape_int64_t_bounds_fr
261 265
ppl_Pointset_Powerset_BD_Shape_int32_ppl_Pointset_Powerset_BD_Shape_int64_t_bounds_fr
259 265
ppl_Pointset_Powerset_BD_Shape_int32_ppl_Pointset_Powerset_BD_Shape_int64_t_concatenat
262 266
ppl_Pointset_Powerset_BD_Shape_int32_ppl_Pointset_Powerset_BD_Shape_int64_t_constrains
260 267
ppl_Pointset_Powerset_BD_Shape_int32_ppl_Pointset_Powerset_BD_Shape_int64_t_contains_
263 265
ppl_Pointset_Powerset_BD_Shape_int32_ppl_Pointset_Powerset_BD_Shape_int64_t_contains_
262 265
ppl_Pointset_Powerset_BD_Shape_int32_ppl_Pointset_Powerset_BD_Shape_int64_t_decrement_
262 268
ppl_Pointset_Powerset_BD_Shape_int32_ppl_Pointset_Powerset_BD_Shape_int64_t_difference
261 266
ppl_Pointset_Powerset_BD_Shape_int32_ppl_Pointset_Powerset_BD_Shape_int64_t_drop_disju
262 268
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_drop_disju
266 269
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_drop_some_
266 268
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_drop_some_
266 268
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_end_iterat
266 268
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_equals_Po
268 266
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_expand_spa
267 268
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_external_
267 268
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_fold_space
264 268
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_generalize
267 267
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_generalize
267 267
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_generalize
268 267
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_generalize
268 267
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_geometrica
269 266
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_geometrica
269 266
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_get_disju
269 268
ppl_Pointset_Powerset_BD_Shape_int64_ppl_Pointset_Powerset_BD_Shape_int64_t_increment_
269 268

ppl_Pointset_Powerset_BD_Shape_int64_t_space_dime
266
ppl_Pointset_Powerset_BD_Shape_int64_t_strictly_c
265
ppl_Pointset_Powerset_BD_Shape_int64_t_swap,
265
ppl_Pointset_Powerset_BD_Shape_int64_t_tBD_Shape_ipr
265
ppl_Pointset_Powerset_BD_Shape_int64_t_topologica
265
ppl_Pointset_Powerset_BD_Shape_int64_t_total_memo
265
ppl_Pointset_Powerset_BD_Shape_int64_t_unconstra
265
ppl_Pointset_Powerset_BD_Shape_int64_t_unconstra
268
ppl_Pointset_Powerset_BD_Shape_int64_t_upper_boun
268
ppl_Pointset_Powerset_BD_Shape_int64_t_upper_boun
265
ppl_Pointset_Powerset_BD_Shape_int8_t_add_congrue
265
ppl_Pointset_Powerset_BD_Shape_int8_t_add_congrue
265
ppl_Pointset_Powerset_BD_Shape_int8_t_add_constra
265
ppl_Pointset_Powerset_BD_Shape_int8_t_add_constra
266
ppl_Pointset_Powerset_BD_Shape_int8_t_add_disjunc
265
ppl_Pointset_Powerset_BD_Shape_int8_t_add_space_d
265
ppl_Pointset_Powerset_BD_Shape_int8_t_add_space_d
266
ppl_Pointset_Powerset_BD_Shape_int8_t_affine_dime
266
ppl_Pointset_Powerset_BD_Shape_int8_t_affine_imag
266
ppl_Pointset_Powerset_BD_Shape_int8_t_affine_prei
266
ppl_Pointset_Powerset_BD_Shape_int8_t_ascii_dump,
265
ppl_Pointset_Powerset_BD_Shape_int8_t_begin_itera
264
ppl_Pointset_Powerset_BD_Shape_int8_t_BGP99_BHMZ0
264
ppl_Pointset_Powerset_BD_Shape_int8_t_BGP99_H79_e
267
ppl_Pointset_Powerset_BD_Shape_int8_t_BHZ03_H79_I
267
ppl_Pointset_Powerset_BD_Shape_int8_t_BHZ03_H79_I
267
ppl_Pointset_Powerset_BD_Shape_int8_t_bounded_afi
268

ppl_Pointset_Powerset_BD_Shape_int8_t_is_bounded, 252
ppl_Pointset_Powerset_BD_Shape_int8_t_is_discrete, 250
ppl_Pointset_Powerset_BD_Shape_int8_t_is_disjoint, 250
ppl_Pointset_Powerset_BD_Shape_int8_t_is_empty, 252
ppl_Pointset_Powerset_BD_Shape_int8_t_is_topologi, 252
ppl_Pointset_Powerset_BD_Shape_int8_t_is_universe, 250
ppl_Pointset_Powerset_BD_Shape_int8_t_iterator_eq, 251
ppl_Pointset_Powerset_BD_Shape_int8_t_map_space_d, 254
ppl_Pointset_Powerset_BD_Shape_int8_t_maximize, 252
ppl_Pointset_Powerset_BD_Shape_int8_t_maximize_wi, 254
ppl_Pointset_Powerset_BD_Shape_int8_t_minimize, 254
ppl_Pointset_Powerset_BD_Shape_int8_t_minimize_wi, 253
ppl_Pointset_Powerset_BD_Shape_int8_t_OK, 253
ppl_Pointset_Powerset_BD_Shape_int8_t_omega_reduc, 253
ppl_Pointset_Powerset_BD_Shape_int8_t_pairwise_re, 251
ppl_Pointset_Powerset_BD_Shape_int8_t_refine_with, 253
ppl_Pointset_Powerset_BD_Shape_int8_t_refine_with, 253
ppl_Pointset_Powerset_BD_Shape_int8_t_refine_with, 253
ppl_Pointset_Powerset_BD_Shape_int8_t_refine_with, 252
ppl_Pointset_Powerset_BD_Shape_int8_t_relation_wi, 253
ppl_Pointset_Powerset_BD_Shape_int8_t_relation_wi, 252
ppl_Pointset_Powerset_BD_Shape_int8_t_relation_wi, 253
ppl_Pointset_Powerset_BD_Shape_int8_t_remove_bin, 251
ppl_Pointset_Powerset_BD_Shape_int8_t_remove_spa, 251
ppl_Pointset_Powerset_BD_Shape_int8_t_simplify_us, 254
ppl_Pointset_Powerset_BD_Shape_int8_t_size, 254
ppl_Pointset_Powerset_BD_Shape_int8_t_space_dimen, 252
ppl_Polyhedron_affine_image, 250
ppl_Polyhedron_affine_preimage, 250
ppl_Polyhedron_bounded_from_above, 250
ppl_Polyhedron_bounded_from_below, 251
ppl_Polyhedron_concatenate_assign, 250
ppl_Polyhedron_contains, 250
ppl_Polyhedron_equality_set, 250
ppl_Polyhedron_expand_space_dimension, 251
ppl_Polyhedron_fold_space_dimensions, 251
ppl_Polyhedron_generalized_affine_image, 251
ppl_Polyhedron_generalized_affine_preimage, 250
ppl_Polyhedron_intersection_assign, 250
ppl_Polyhedron_is_disjoint_from_, 252
ppl_Polyhedron_minimized_constr, 250
ppl_Polyhedron_minimized_ray, 250
ppl_Polyhedron_relation_with, 250
ppl_Polyhedron_remove_space_dimensions, 253
ppl_Polyhedron_time_elapse_assign, 250
ppl_Polyhedron_topological_closure_assign, 250
ppl_Polyhedron_unconstrain, 252
ppl_Polyhedron_upper_bound_assign, 250

ppl_Pointset_Powerset_BD_Shape_int8_t_add_space_dimensions_and_project, 251
ppl_Pointset_Powerset_BD_Shape_int8_t_affine_image, 250
ppl_Pointset_Powerset_BD_Shape_int8_t_affine_preimage, 252
ppl_Pointset_Powerset_BD_Shape_int8_t_bounded_affine_image, 250
ppl_Pointset_Powerset_BD_Shape_int8_t_bounded_affine_preimage, 253
ppl_Pointset_Powerset_BD_Shape_int8_t_concatenate_assign, 252
ppl_Pointset_Powerset_BD_Shape_int8_t_constrain, 252
ppl_Pointset_Powerset_BD_Shape_int8_t_contains, 252
ppl_Pointset_Powerset_BD_Shape_int8_t_difference_assign, 252
ppl_Pointset_Powerset_BD_Shape_int8_t_drop_disjuncts, 252
ppl_Pointset_Powerset_BD_Shape_long_double_add_constraint, 457
ppl_Pointset_Powerset_BD_Shape_long_double_add_constraints, 458
ppl_Pointset_Powerset_BD_Shape_long_double_add_constraints_and_minimize, 457
ppl_Pointset_Powerset_BD_Shape_long_double_add_constraints_and_minimize_2, 458
ppl_Pointset_Powerset_BD_Shape_long_double_add_disjunct, 460
ppl_Pointset_Powerset_BD_Shape_long_double_add_space_dimensions_and_embed, 459
ppl_Pointset_Powerset_BD_Shape_long_double_add_space_dimensions_and_project, 459
ppl_Pointset_Powerset_BD_Shape_long_double_affine_preimage, 456
ppl_Pointset_Powerset_BD_Shape_long_double_generalized_affine_image, 458
ppl_Pointset_Powerset_BD_Shape_long_double_generalized_affine_preimage, 459
ppl_Pointset_Powerset_BD_Shape_long_double_generalized_affine_image_lhs_rhs, 459
ppl_Pointset_Powerset_BD_Shape_long_double_generalized_affine_preimage_lhs_rhs, 460
ppl_Pointset_Powerset_BD_Shape_long_double_geometrically_covers_Grid, 460
ppl_Pointset_Powerset_BD_Shape_long_double_geometrically_covers_Grid_Powerset, 460
ppl_Pointset_Powerset_BD_Shape_long_double_get_disjunct, 460
ppl_Pointset_Powerset_BD_Shape_long_double_increment_iterator, 460
ppl_Pointset_Powerset_BD_Shape_long_double_intersection_assign, 459
ppl_Pointset_Powerset_BD_Shape_long_double_is_bounded, 459
ppl_Pointset_Powerset_BD_Shape_long_double_is_disjunct_redundant, 457
ppl_Pointset_Powerset_BD_Shape_long_double_is_empty, 457
ppl_Pointset_Powerset_BD_Shape_long_double_is_universe, 457
ppl_Pointset_Powerset_BD_Shape_long_double_is_topologically_closed, 457
ppl_Pointset_Powerset_BD_Shape_long_double_is_universe, 457
ppl_Pointset_Powerset_BD_Shape_long_double_limited_BHZ03_extrapolation_assign, 457
ppl_Pointset_Powerset_BD_Shape_long_double_limited_H79_extrapolation_assign, 457
ppl_Pointset_Powerset_BD_Shape_long_double_limited_BHMZ05_widening_assign, 460
ppl_Pointset_Powerset_BD_Shape_long_double_limited_H79_widening_assign, 460
ppl_Pointset_Powerset_BD_Shape_long_double_linear_partition, 458
ppl_Pointset_Powerset_BD_Shape_long_double_linear_partition_2, 456
ppl_Pointset_Powerset_BD_Shape_long_double_maximize, 457
ppl_Pointset_Powerset_BD_Shape_long_double_maximize_2, 457
ppl_Pointset_Powerset_BD_Shape_long_double_minimize, 458
ppl_Pointset_Powerset_BD_Shape_long_double_minimize_2, 458
ppl_Pointset_Powerset_BD_Shape_long_double_OK, 460
ppl_Pointset_Powerset_BD_Shape_long_double_omega_reduce, 459
ppl_Pointset_Powerset_BD_Shape_long_double_ordering_equals, 460
ppl_Pointset_Powerset_BD_Shape_long_double_ordering_geq, 460
ppl_Pointset_Powerset_BD_Shape_long_double_ordering_leq, 460
ppl_Pointset_Powerset_BD_Shape_long_double_ordering_lt, 460
ppl_Pointset_Powerset_BD_Shape_long_double_ordering_same_as, 460
ppl_Pointset_Powerset_BD_Shape_long_double_pairwise_reduce, 459
ppl_Pointset_Powerset_BD_Shape_long_double_poly_difference_assign, 459
ppl_Pointset_Powerset_BD_Shape_long_double_poly_hull_assign, 459
ppl_Pointset_Powerset_BD_Shape_long_double_poly_hull_assign_and_minimize, 459
ppl_Pointset_Powerset_BD_Shape_long_double_remove_disjunct, 460
ppl_Pointset_Powerset_BD_Shape_long_double_remove_space_dimensions, 459
ppl_Pointset_Powerset_BD_Shape_long_double_remove_universe_disjuncts, 460
ppl_Pointset_Powerset_BD_Shape_long_double_size, 460
ppl_Pointset_Powerset_BD_Shape_long_double_upper_bound_assign, 459
ppl_Pointset_Powerset_BD_Shape_long_double_upper_bound_assign_if_exact, 459
ppl_Pointset_Powerset_BD_Shape_long_double_wrap_assign, 459
ppl_Pointset_Powerset_BD_Shape_mpz_class_add_constraint, 457
ppl_Pointset_Powerset_BD_Shape_mpz_class_add_constraints, 458
ppl_Pointset_Powerset_BD_Shape_mpz_class_add_constraints_and_minimize, 457
ppl_Pointset_Powerset_BD_Shape_mpz_class_add_constraints_and_minimize_2, 458
ppl_Pointset_Powerset_BD_Shape_mpz_class_add_disjunct, 460
ppl_Pointset_Powerset_BD_Shape_mpz_class_add_space_dimensions_and_embed, 459
ppl_Pointset_Powerset_BD_Shape_mpz_class_add_space_dimensions_and_project, 459
ppl_Pointset_Powerset_BD_Shape_mpz_class_affine_preimage, 456
ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_image, 458
ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_preimage, 459
ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_image_lhs_rhs, 459
ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_preimage_lhs_rhs, 460
ppl_Pointset_Powerset_BD_Shape_mpz_class_geometrically_covers_Grid, 460
ppl_Pointset_Powerset_BD_Shape_mpz_class_geometrically_covers_Grid_Powerset, 460
ppl_Pointset_Powerset_BD_Shape_mpz_class_get_disjunct, 460
ppl_Pointset_Powerset_BD_Shape_mpz_class_increment_iterator, 460
ppl_Pointset_Powerset_BD_Shape_mpz_class_intersection_assign, 459
ppl_Pointset_Powerset_BD_Shape_mpz_class_is_bounded, 459
ppl_Pointset_Powerset_BD_Shape_mpz_class_is_disjunct_redundant, 457
ppl_Pointset_Powerset_BD_Shape_mpz_class_is_empty, 457
ppl_Pointset_Powerset_BD_Shape_mpz_class_is_universe, 457
ppl_Pointset_Powerset_BD_Shape_mpz_class_is_topologically_closed, 457
ppl_Pointset_Powerset_BD_Shape_mpz_class_is_universe, 457
ppl_Pointset_Powerset_BD_Shape_mpz_class_limited_BHZ03_extrapolation_assign, 457
ppl_Pointset_Powerset_BD_Shape_mpz_class_limited_H79_extrapolation_assign, 457
ppl_Pointset_Powerset_BD_Shape_mpz_class_limited_BHMZ05_widening_assign, 460
ppl_Pointset_Powerset_BD_Shape_mpz_class_limited_H79_widening_assign, 460
ppl_Pointset_Powerset_BD_Shape_mpz_class_linear_partition, 458
ppl_Pointset_Powerset_BD_Shape_mpz_class_linear_partition_2, 456

ppl_Pointset_Powerset_BD_Shape_long_double_is_discrete, 456
ppl_Pointset_Powerset_BD_Shape_long_double_is_disjoint_from_Pointset_Powerset_BD_Shape_long_double, 457
ppl_Pointset_Powerset_BD_Shape_long_double_is_empty, 456
ppl_Pointset_Powerset_BD_Shape_long_double_is_topologically_closed, 456
ppl_Pointset_Powerset_BD_Shape_long_double_is_universe, 456
ppl_Pointset_Powerset_BD_Shape_long_double_iterator_equals_iterator, 460
ppl_Pointset_Powerset_BD_Shape_long_double_map_space_dimensions, 459
ppl_Pointset_Powerset_BD_Shape_long_double_maximize, 457
ppl_Pointset_Powerset_BD_Shape_long_double_maximize_with_point, 457
ppl_Pointset_Powerset_BD_Shape_long_double_minimize, 457
ppl_Pointset_Powerset_BD_Shape_long_double_minimize_with_point, 457
ppl_Pointset_Powerset_BD_Shape_long_double_OK, 457
ppl_Pointset_Powerset_BD_Shape_long_double_omega_reduce, 457
ppl_Pointset_Powerset_BD_Shape_long_double_pairwise_reduce, 457
ppl_Pointset_Powerset_BD_Shape_long_double_refine_with_congruence, 458
ppl_Pointset_Powerset_BD_Shape_long_double_refine_with_congruences, 458
ppl_Pointset_Powerset_BD_Shape_long_double_refine_with_constraint, 458
ppl_Pointset_Powerset_BD_Shape_long_double_refine_with_constraints, 458
ppl_Pointset_Powerset_BD_Shape_long_double_relation_with_congruence, 456
ppl_Pointset_Powerset_BD_Shape_long_double_relation_with_constraint, 456
ppl_Pointset_Powerset_BD_Shape_long_double_relation_with_generator, 456
ppl_Pointset_Powerset_BD_Shape_long_double_remove_higher_space_dimensions, 459
ppl_Pointset_Powerset_BD_Shape_long_double_remove_space_dimensions, 459
ppl_Pointset_Powerset_BD_Shape_long_double_simplify_using_context_assign, 458
ppl_Pointset_Powerset_BD_Shape_long_double_size, 460
ppl_Pointset_Powerset_BD_Shape_long_double_space_dimension, 456
ppl_Pointset_Powerset_BD_Shape_long_double_strictly_contains_Pointset_Powerset_BD_Shape_long_double, 457
ppl_Pointset_Powerset_BD_Shape_long_double_swap, 456
ppl_Pointset_Powerset_BD_Shape_long_double_ti 458
ppl_Pointset_Powerset_BD_Shape_long_double_topolo 456
ppl_Pointset_Powerset_BD_Shape_long_double_total_ 460
ppl_Pointset_Powerset_BD_Shape_long_double_uncons 458
ppl_Pointset_Powerset_BD_Shape_long_double_uncons 458
ppl_Pointset_Powerset_BD_Shape_long_double_upper_ 458
ppl_Pointset_Powerset_BD_Shape_long_double_upper_ 458
ppl_Pointset_Powerset_BD_Shape_mpq_class_add_cong 271
ppl_Pointset_Powerset_BD_Shape_mpq_class_add_cong 271
ppl_Pointset_Powerset_BD_Shape_mpq_class_add_cons 271
ppl_Pointset_Powerset_BD_Shape_mpq_class_add_cons 271
ppl_Pointset_Powerset_BD_Shape_mpq_class_add_disj 273
ppl_Pointset_Powerset_BD_Shape_mpq_class_add_spac 272
ppl_Pointset_Powerset_BD_Shape_mpq_class_add_spac 272
ppl_Pointset_Powerset_BD_Shape_mpq_class_affine_d 269
ppl_Pointset_Powerset_BD_Shape_mpq_class_affine_i 272
ppl_Pointset_Powerset_BD_Shape_mpq_class_affine_p 272
ppl_Pointset_Powerset_BD_Shape_mpq_class_ascii_du 273
ppl_Pointset_Powerset_BD_Shape_mpq_class_begin_it 273
ppl_Pointset_Powerset_BD_Shape_mpq_class_BGP99_BH 274
ppl_Pointset_Powerset_BD_Shape_mpq_class_BGP99_H 274
ppl_Pointset_Powerset_BD_Shape_mpq_class_BHZ03_H 274
ppl_Pointset_Powerset_BD_Shape_mpq_class_BHZ03_H 274
ppl_Pointset_Powerset_BD_Shape_mpq_class_bounded_ 272
ppl_Pointset_Powerset_BD_Shape_mpq_class_bounded_ 272
ppl_Pointset_Powerset_BD_Shape_mpq_class_bo 270

ppl_Pointset_Powerset_BD_Shape_mpq_class_is_disjoint_from_closed, 270
ppl_Pointset_Powerset_BD_Shape_mpq_class_is_empty, 270
ppl_Pointset_Powerset_BD_Shape_mpq_class_is_topologically_closed, 270
ppl_Pointset_Powerset_BD_Shape_mpq_class_is_universe, 270
ppl_Pointset_Powerset_BD_Shape_mpq_class_map_space_dimensions, 273
ppl_Pointset_Powerset_BD_Shape_mpq_class_maximize, 270
ppl_Pointset_Powerset_BD_Shape_mpq_class_maximize_with_point, 270
ppl_Pointset_Powerset_BD_Shape_mpq_class_minimize, 270
ppl_Pointset_Powerset_BD_Shape_mpq_class_minimize_with_point, 270
ppl_Pointset_Powerset_BD_Shape_mpq_class_OK, 271
ppl_Pointset_Powerset_BD_Shape_mpq_class_omega_reduce, 270
ppl_Pointset_Powerset_BD_Shape_mpq_class_poly_difference_assign, 270
ppl_Pointset_Powerset_BD_Shape_mpq_class_refine_with_constraint, 271
ppl_Pointset_Powerset_BD_Shape_mpq_class_refine_with_constraints, 271
ppl_Pointset_Powerset_BD_Shape_mpq_class_refine_with_congruence, 271
ppl_Pointset_Powerset_BD_Shape_mpq_class_refine_with_congruences, 271
ppl_Pointset_Powerset_BD_Shape_mpq_class_relation_with_constraint, 269
ppl_Pointset_Powerset_BD_Shape_mpq_class_relation_with_generator, 269
ppl_Pointset_Powerset_BD_Shape_mpq_class_relation_with_congruence, 269
ppl_Pointset_Powerset_BD_Shape_mpq_class_remove_space_dimensions, 272
ppl_Pointset_Powerset_BD_Shape_mpq_class_remove_higher_space_dimensions, 272
ppl_Pointset_Powerset_BD_Shape_mpq_class_simplify_using_context_assign, 272
ppl_Pointset_Powerset_BD_Shape_mpq_class_size, 273
ppl_Pointset_Powerset_BD_Shape_mpq_class_space_dimension, 269
ppl_Pointset_Powerset_BD_Shape_mpq_class_strictly_contains, 270
ppl_Pointset_Powerset_BD_Shape_mpq_class_swap, 269

ppl_Pointset_Powerset_BD_Shape_mpq_class_add_space_dimensions_and_embed, 271
ppl_Pointset_Powerset_BD_Shape_mpq_class_add_space_dimensions_and_project, 271
ppl_Pointset_Powerset_BD_Shape_mpq_class_affine_form_image, 274
ppl_Pointset_Powerset_BD_Shape_mpq_class_affine_image, 277
ppl_Pointset_Powerset_BD_Shape_mpq_class_affine_preimage, 277
ppl_Pointset_Powerset_BD_Shape_mpq_class_ascii_dump, 278
ppl_Pointset_Powerset_BD_Shape_mpq_class_bounded_affine_image, 277
ppl_Pointset_Powerset_BD_Shape_mpq_class_bounded_affine_preimage, 277
ppl_Pointset_Powerset_BD_Shape_mpq_class_bounds_from_above, 275
ppl_Pointset_Powerset_BD_Shape_mpq_class_bounds_from_below, 275
ppl_Pointset_Powerset_BD_Shape_mpq_class_concatenate_assign, 276
ppl_Pointset_Powerset_BD_Shape_mpq_class_constrains, 277
ppl_Pointset_Powerset_BD_Shape_mpq_class_contains_integer_point, 275
ppl_Pointset_Powerset_BD_Shape_mpq_class_contains_integer_point, 275
ppl_Pointset_Powerset_BD_Shape_mpq_class_decrement_with_complement, 278
ppl_Pointset_Powerset_BD_Shape_mpq_class_difference_assign, 276
ppl_Pointset_Powerset_BD_Shape_mpq_class_drop_disjuncts, 278
ppl_Pointset_Powerset_BD_Shape_mpz_class_drop_disjuncts, 278
ppl_Pointset_Powerset_BD_Shape_mpz_class_drop_some_non_integer_points, 278
ppl_Pointset_Powerset_BD_Shape_mpz_class_drop_some_points, 278
ppl_Pointset_Powerset_BD_Shape_mpz_class_end_iterator, 278
ppl_Pointset_Powerset_BD_Shape_mpz_class_equals_bool, 276
ppl_Pointset_Powerset_BD_Shape_mpz_class_expand_space_dimension, 277
ppl_Pointset_Powerset_BD_Shape_mpz_class_external_memory_in_bytes, 278
ppl_Pointset_Powerset_BD_Shape_mpz_class_fold_space_dimensions, 277
ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_image, 277
ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_preimage, 277
ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_image, 277
ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_preimage, 277
ppl_Pointset_Powerset_BD_Shape_mpz_class_geometrically_covers, 275
ppl_Pointset_Powerset_BD_Shape_mpz_class_geometrically_equals, 275
ppl_Pointset_Powerset_BD_Shape_mpz_class_get_disjunct, 278
ppl_Pointset_Powerset_BD_Shape_mpz_class_increment_with_complement, 278
ppl_Pointset_Powerset_BD_Shape_mpz_class_intersection_assign, 276
ppl_Pointset_Powerset_BD_Shape_mpz_class_is_bounded, 275
ppl_Pointset_Powerset_BD_Shape_mpz_class_is_disjoint_with_complement, 275
ppl_Pointset_Powerset_BD_Shape_mpz_class_is_disjoint_with_complement, 275

ppl_Pointset_Powerset_BD_Shape_mpz_class_is_empty, 274
ppl_Pointset_Powerset_BD_Shape_mpz_class_is_topologically_closed, 275
ppl_Pointset_Powerset_BD_Shape_mpz_class_is_universe, 274
ppl_Pointset_Powerset_BD_Shape_mpz_class_iterator_equals_iterator, 278
ppl_Pointset_Powerset_BD_Shape_mpz_class_map_space_dimensions, 277
ppl_Pointset_Powerset_BD_Shape_mpz_class_maximize, 275
ppl_Pointset_Powerset_BD_Shape_mpz_class_maximize_with_point, 275
ppl_Pointset_Powerset_BD_Shape_mpz_class_minimize, 275
ppl_Pointset_Powerset_BD_Shape_mpz_class_minimize_with_point, 275
ppl_Pointset_Powerset_BD_Shape_mpz_class_OK, 276
ppl_Pointset_Powerset_BD_Shape_mpz_class_omega_reduce, 275
ppl_Pointset_Powerset_BD_Shape_mpz_class_pairwise_reduce, 275
ppl_Pointset_Powerset_BD_Shape_mpz_class_refine_with_congruence, 276
ppl_Pointset_Powerset_BD_Shape_mpz_class_refine_with_congruences, 276
ppl_Pointset_Powerset_BD_Shape_mpz_class_refine_with_constraint, 276
ppl_Pointset_Powerset_BD_Shape_mpz_class_refine_with_constraints, 276
ppl_Pointset_Powerset_BD_Shape_mpz_class_relation_with_congruence, 274
ppl_Pointset_Powerset_BD_Shape_mpz_class_relation_with_constraint, 274
ppl_Pointset_Powerset_BD_Shape_mpz_class_relation_with_generator, 274
ppl_Pointset_Powerset_BD_Shape_mpz_class_remove_higher_space_dimensions, 277
ppl_Pointset_Powerset_BD_Shape_mpz_class_remove_space_dimensions, 277
ppl_Pointset_Powerset_BD_Shape_mpz_class_simplify_using_context_assign, 276
ppl_Pointset_Powerset_BD_Shape_mpz_class_size, 278
ppl_Pointset_Powerset_BD_Shape_mpz_class_space_dimension, 274
ppl_Pointset_Powerset_BD_Shape_mpz_class_strictly_contains_Pointset_Powerset_BD_Shape, 275
ppl_Pointset_Powerset_BD_Shape_mpz_class_swap, 274
ppl_Pointset_Powerset_BD_Shape_mpz_class_time_elapse_assign, 276

ppl_Pointset_Powerset_BD_Shape_mpz_class_topologi 275
ppl_Pointset_Powerset_BD_Shape_mpz_class_total_me 278
ppl_Pointset_Powerset_BD_Shape_mpz_class_unconst 277
ppl_Pointset_Powerset_BD_Shape_mpz_class_unconst 277
ppl_Pointset_Powerset_BD_Shape_mpz_class_upper_bo 276
ppl_Pointset_Powerset_BD_Shape_mpz_class_upper_bo 276
ppl_Pointset_Powerset_C_Polyhedron_add_congruence 310
ppl_Pointset_Powerset_C_Polyhedron_add_congruence 310
ppl_Pointset_Powerset_C_Polyhedron_add_constraint 310
ppl_Pointset_Powerset_C_Polyhedron_add_constraint 310
ppl_Pointset_Powerset_C_Polyhedron_add_disjunct, 313
ppl_Pointset_Powerset_C_Polyhedron_add_space_dime 312
ppl_Pointset_Powerset_C_Polyhedron_add_space_dime 312
ppl_Pointset_Powerset_C_Polyhedron_affine_dimensi 309
ppl_Pointset_Powerset_C_Polyhedron_affine_image, 311
ppl_Pointset_Powerset_C_Polyhedron_affine_preimag 311
ppl_Pointset_Powerset_C_Polyhedron_ascii_dump, 312
ppl_Pointset_Powerset_C_Polyhedron_begin_iterato 312
ppl_Pointset_Powerset_C_Polyhedron_BGP99_BHRZ03_e 313
ppl_Pointset_Powerset_C_Polyhedron_BGP99_H79_exti 313
ppl_Pointset_Powerset_C_Polyhedron_BHZ03_BHRZ03_I 313
ppl_Pointset_Powerset_C_Polyhedron_BHZ03_H79_H79 313
ppl_Pointset_Powerset_C_Polyhedron_bounded_affine 311
ppl_Pointset_Powerset_C_Polyhedron_bounded_affine 311
ppl_Pointset_Powerset_C_Polyhedron_bounds_from_a 309
ppl_Pointset_Powerset_C_Polyhedron_bounds_from_be 309
ppl_Pointset_Powerset_C_Polyhedron_concatenate_as 311

ppl_Pointset_Powerset_C_Polyhedron_copy, 311
ppl_Pointset_Powerset_C_Polyhedron_add_constraint, 309
ppl_Pointset_Powerset_C_Polyhedron_add_constraints, 309
ppl_Pointset_Powerset_C_Polyhedron_add_space_dimensions_and_embed, 310
ppl_Pointset_Powerset_C_Polyhedron_affine_image, 312
ppl_Pointset_Powerset_C_Polyhedron_affine_preimage, 313
ppl_Pointset_Powerset_C_Polyhedron_bounded_difference, 311
ppl_Pointset_Powerset_C_Polyhedron_bounds_from_above, 313
ppl_Pointset_Powerset_C_Polyhedron_bounds_from_below, 313
ppl_Pointset_Powerset_C_Polyhedron_concatenate_assign, 312
ppl_Pointset_Powerset_C_Polyhedron_contains, 312
ppl_Pointset_Powerset_C_Polyhedron_contains_integer_point, 312
ppl_Pointset_Powerset_C_Polyhedron_difference_assign, 313
ppl_Pointset_Powerset_C_Polyhedron_drop_some_non_integer_points, 312
ppl_Pointset_Powerset_C_Polyhedron_drop_some_non_integer_points_2, 312
ppl_Pointset_Powerset_C_Polyhedron_equals, 312
ppl_Pointset_Powerset_C_Polyhedron_expand_space_dimension, 312
ppl_Pointset_Powerset_C_Polyhedron_expand_space_dimensions, 312
ppl_Pointset_Powerset_C_Polyhedron_fold_space_dimensions, 312
ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_image, 311
ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_image_lhs_rhs, 312
ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_preimage, 311
ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_preimage_lhs_rhs, 312
ppl_Pointset_Powerset_C_Polyhedron_geometrically_covers, 310
ppl_Pointset_Powerset_C_Polyhedron_geometrically_equals, 310
ppl_Pointset_Powerset_C_Polyhedron_get_disjunct, 313
ppl_Pointset_Powerset_C_Polyhedron_intersection_assign, 312
ppl_Pointset_Powerset_C_Polyhedron_intersection_assign_and_minimized, 311
ppl_Pointset_Powerset_C_Polyhedron_is_bounded, 309
ppl_Pointset_Powerset_C_Polyhedron_is_disjoint_from_closed_convex_polyhedron, 310
ppl_Pointset_Powerset_C_Polyhedron_is_empty, 309
ppl_Pointset_Powerset_C_Polyhedron_is_topologically_closed, 309
ppl_Pointset_Powerset_C_Polyhedron_is_universe, 309
ppl_Pointset_Powerset_C_Polyhedron_iterator_equal_test, 312
ppl_Pointset_Powerset_C_Polyhedron_map_space_dimensions, 312
ppl_Pointset_Powerset_C_Polyhedron_maximize, 309
ppl_Pointset_Powerset_C_Polyhedron_maximize_with_reduction, 309
ppl_Pointset_Powerset_C_Polyhedron_minimize, 309
ppl_Pointset_Powerset_C_Polyhedron_minimize_with_reduction, 310
ppl_Pointset_Powerset_C_Polyhedron_OK, 310
ppl_Pointset_Powerset_C_Polyhedron_omega_reduce, 309
ppl_Pointset_Powerset_C_Polyhedron_pairwise_reduce, 309
ppl_Pointset_Powerset_C_Polyhedron_refine_with_constraint, 310
ppl_Pointset_Powerset_C_Polyhedron_refine_with_congruence, 310
ppl_Pointset_Powerset_C_Polyhedron_refine_with_congruences, 310
ppl_Pointset_Powerset_C_Polyhedron_refine_with_criterion, 310
ppl_Pointset_Powerset_C_Polyhedron_relation_with_constraint, 309
ppl_Pointset_Powerset_C_Polyhedron_relation_with_congruence, 309
ppl_Pointset_Powerset_C_Polyhedron_relation_with_generator, 309
ppl_Pointset_Powerset_C_Polyhedron_remove_disjunct, 312
ppl_Pointset_Powerset_C_Polyhedron_remove_disjuncts, 312
ppl_Pointset_Powerset_C_Polyhedron_simplify_using_context_assign, 311
ppl_Pointset_Powerset_C_Polyhedron_size, 312
ppl_Pointset_Powerset_C_Polyhedron_space_dimension, 309
ppl_Pointset_Powerset_C_Polyhedron_strictly_contains, 310
ppl_Pointset_Powerset_C_Polyhedron_swap, 309
ppl_Pointset_Powerset_C_Polyhedron_upper_bound_assign, 311
ppl_Pointset_Powerset_C_Polyhedron_topological_closure_assign, 309

ppl_Pointset_Powerset_C_Polyhedron_topological_closure_assign, 312
ppl_Pointset_Powerset_C_Polyhedron_upper_bound_assign, 311
ppl_Pointset_Powerset_C_Polyhedron_upper_bound_assign_if_exact, 311
ppl_Pointset_Powerset_C_Polyhedron_upper_bound_assign_if_exact, 311
ppl_Pointset_Powerset_Double_Box_add_disjunct, 414
ppl_Pointset_Powerset_Double_Box_add_disjuncts, 414
ppl_Pointset_Powerset_Double_Box_add_disjuncts, 414
ppl_Pointset_Powerset_Double_Box_add_disjuncts, 414
ppl_Pointset_Powerset_Double_Box_add_space_dimensions_and_embed, 415
ppl_Pointset_Powerset_Double_Box_add_space_dimensions_and_project, 415
ppl_Pointset_Powerset_Double_Box_affine_dimension, 412
ppl_Pointset_Powerset_Double_Box_affine_image, 415
ppl_Pointset_Powerset_Double_Box_affine_preimage, 415
ppl_Pointset_Powerset_Double_Box_ascii_dump, 416
ppl_Pointset_Powerset_Double_Box_begin_iterator, 416
ppl_Pointset_Powerset_Double_Box_bounded_affine_image, 415
ppl_Pointset_Powerset_Double_Box_bounded_affine_preimage, 415
ppl_Pointset_Powerset_Double_Box_bounds_from_above, 413
ppl_Pointset_Powerset_Double_Box_bounds_from_below, 413
ppl_Pointset_Powerset_Double_Box_concatenate_assign, 414
ppl_Pointset_Powerset_Double_Box_constrains, 415
ppl_Pointset_Powerset_Double_Box_contains_integer_point, 413
ppl_Pointset_Powerset_Double_Box_contains_Pointset_Powerset_Double_Box, 413
ppl_Pointset_Powerset_Double_Box_decrement_iterator, 416
ppl_Pointset_Powerset_Double_Box_difference_assign, 414
ppl_Pointset_Powerset_Double_Box_drop_disjunct, 416
ppl_Pointset_Powerset_Double_Box_drop_disjuncts, 416
ppl_Pointset_Powerset_Double_Box_drop_some_non_integer_disjuncts, 416
ppl_Pointset_Powerset_Double_Box_drop_some_non_integer_disjuncts, 416
ppl_Pointset_Powerset_Double_Box_end_iterator, 416
ppl_Pointset_Powerset_Double_Box_equals_Pointset_Powerset_Double_Box, 414
ppl_Pointset_Powerset_Double_Box_expand_space_dimension, 415
ppl_Pointset_Powerset_Double_Box_external_memory_in_bytes, 416
ppl_Pointset_Powerset_Double_Box_fold_space_dimensions, 416
ppl_Pointset_Powerset_Double_Box_generalized_affine_image, 415
ppl_Pointset_Powerset_Double_Box_generalized_affine_image_lhs_rhs, 415
ppl_Pointset_Powerset_Double_Box_generalized_affine_preimage, 415
ppl_Pointset_Powerset_Double_Box_generalized_affine_preimage_lhs_rhs, 415
ppl_Pointset_Powerset_Double_Box_geometrically_covers_Pointset_Powerset_Double_Box, 414
ppl_Pointset_Powerset_Double_Box_geometrically_equals_Pointset_Powerset_Double_Box, 414
ppl_Pointset_Powerset_Double_Box_get_disjunct, 416
ppl_Pointset_Powerset_Double_Box_increment_iterator, 416
ppl_Pointset_Powerset_Double_Box_intersection_assign, 414
ppl_Pointset_Powerset_Double_Box_is_bounded, 413
ppl_Pointset_Powerset_Double_Box_is_discrete, 413
ppl_Pointset_Powerset_Double_Box_is_disjoint_from_Pointset_Powerset_Double_Box, 414
ppl_Pointset_Powerset_Double_Box_is_empty, 413
ppl_Pointset_Powerset_Double_Box_is_topologically_closed, 413
ppl_Pointset_Powerset_Double_Box_is_universe, 413
ppl_Pointset_Powerset_Double_Box_iterator_equals_Pointset_Powerset_Double_Box_iterator, 416
ppl_Pointset_Powerset_Double_Box_map_space_dimensions, 416
ppl_Pointset_Powerset_Double_Box_maximize, 413

ppl_Pointset_Powerset_Double_Box_maximize, 413
ppl_Pointset_Powerset_Double_Box_minimize, 413
ppl_Pointset_Powerset_Double_Box_minimize_with_point, 413
ppl_Pointset_Powerset_Double_Box_OK, 414
ppl_Pointset_Powerset_Double_Box_omega_reduce, 413
ppl_Pointset_Powerset_Double_Box_pairwise_reduce, 413
ppl_Pointset_Powerset_Double_Box_refine_with_congruence, 414
ppl_Pointset_Powerset_Double_Box_refine_with_congruences, 414
ppl_Pointset_Powerset_Double_Box_refine_with_constraint, 414
ppl_Pointset_Powerset_Double_Box_refine_with_constraints, 414
ppl_Pointset_Powerset_Double_Box_relation_with_congruence, 413
ppl_Pointset_Powerset_Double_Box_relation_with_constraint, 413
ppl_Pointset_Powerset_Double_Box_relation_with_generator, 413
ppl_Pointset_Powerset_Double_Box_remove_higher_space_dimensions, 415
ppl_Pointset_Powerset_Double_Box_remove_space_dimensions, 415
ppl_Pointset_Powerset_Double_Box_simplify_using_context_assign, 415
ppl_Pointset_Powerset_Double_Box_size, 416
ppl_Pointset_Powerset_Double_Box_space_dimension, 412
ppl_Pointset_Powerset_Double_Box_strictly_contains_Powerset, 414
ppl_Pointset_Powerset_Double_Box_swap, 412
ppl_Pointset_Powerset_Double_Box_time_elapse_assign, 414
ppl_Pointset_Powerset_Double_Box_topological_closure_assign, 413
ppl_Pointset_Powerset_Double_Box_total_memory_in_bytes, 416
ppl_Pointset_Powerset_Double_Box_uncompress, 415
ppl_Pointset_Powerset_Double_Box_upper_bound_assign, 414
ppl_Pointset_Powerset_Double_Box_upper_bound_assign_if_exact, 415
ppl_Pointset_Powerset_Float_Box_add_congruence, 377
ppl_Pointset_Powerset_Float_Box_add_congruences, 377
ppl_Pointset_Powerset_Float_Box_add_constraint, 377
ppl_Pointset_Powerset_Float_Box_add_constraints, 377
ppl_Pointset_Powerset_Float_Box_add_disjunct, 380
ppl_Pointset_Powerset_Float_Box_add_space_dimens 379
ppl_Pointset_Powerset_Float_Box_add_space_dimens 379
ppl_Pointset_Powerset_Float_Box_affine_dimension, 376
ppl_Pointset_Powerset_Float_Box_affine_image, 378
ppl_Pointset_Powerset_Float_Box_affine_preimage, 378
ppl_Pointset_Powerset_Float_Box_ascii_dump, 379
ppl_Pointset_Powerset_Float_Box_begin_iterator, 379
ppl_Pointset_Powerset_Float_Box_bounded_affine_in 378
ppl_Pointset_Powerset_Float_Box_bounded_affine_pr 378
ppl_Pointset_Powerset_Float_Box_bounds_from_above 376
ppl_Pointset_Powerset_Float_Box_bounds_from_belo 376
ppl_Pointset_Powerset_Float_Box_concatenate_assig 378
ppl_Pointset_Powerset_Float_Box_constrains, 378
ppl_Pointset_Powerset_Float_Box_contains_DoublesBox_integer 376
ppl_Pointset_Powerset_Float_Box_contains_Pointset 377
ppl_Pointset_Powerset_Float_Box_decrement_iterato 379
ppl_Pointset_Powerset_Float_Box_difference_assign 378
ppl_Pointset_Powerset_Float_Box_drop_disjunct, 380
ppl_Pointset_Powerset_Float_Box_drop_disjuncts, 380
ppl_Pointset_Powerset_Float_Box_drop_some_non_int 379
ppl_Pointset_Powerset_Float_Box_drop_some_non_int 379
ppl_Pointset_Powerset_Float_Box_end_iterator, 379

ppl_Pointset_Powerset_Float_Box_equals, 377
ppl_Pointset_Powerset_Float_Box_expand_space_dimension, 379
ppl_Pointset_Powerset_Float_Box_external_memory_in_bytes, 379
ppl_Pointset_Powerset_Float_Box_fold_space_dimensions, 379
ppl_Pointset_Powerset_Float_Box_generalized_affine_image, 378
ppl_Pointset_Powerset_Float_Box_generalized_affine_image_lhs_rhs, 379
ppl_Pointset_Powerset_Float_Box_generalized_affine_preimage, 378
ppl_Pointset_Powerset_Float_Box_generalized_affine_preimage_lhs_rhs, 379
ppl_Pointset_Powerset_Float_Box_geometrically_covers, 377
ppl_Pointset_Powerset_Float_Box_geometrically_equals, 377
ppl_Pointset_Powerset_Float_Box_get_disjunct, 380
ppl_Pointset_Powerset_Float_Box_increment, 379
ppl_Pointset_Powerset_Float_Box_intersection_assign, 378
ppl_Pointset_Powerset_Float_Box_is_bounded, 376
ppl_Pointset_Powerset_Float_Box_is_discrete, 376
ppl_Pointset_Powerset_Float_Box_is_disjoint_from_closed_fp_interval, 377
ppl_Pointset_Powerset_Float_Box_is_empty, 376
ppl_Pointset_Powerset_Float_Box_is_topologically_closed, 376
ppl_Pointset_Powerset_Float_Box_is_universe, 376
ppl_Pointset_Powerset_Float_Box_iterator_equals_const_iterator, 379
ppl_Pointset_Powerset_Float_Box_map_space_dimensions, 379
ppl_Pointset_Powerset_Float_Box_maximize, 377
ppl_Pointset_Powerset_Float_Box_maximize_with_point, 377
ppl_Pointset_Powerset_Float_Box_minimize, 377
ppl_Pointset_Powerset_Float_Box_minimize_with_point, 377
ppl_Pointset_Powerset_Float_Box_OK, 377
ppl_Pointset_Powerset_Float_Box_omega_reduce, 376
ppl_Pointset_Powerset_Float_Box_pairwise_reduce, 376
ppl_Pointset_Powerset_Float_Box_refine_with_congruence, 377
ppl_Pointset_Powerset_Float_Box_refine_with_congruences, 377
ppl_Pointset_Powerset_Float_Box_refine_with_constraint, 377
ppl_Pointset_Powerset_Float_Box_refine_with_constraints, 377
ppl_Pointset_Powerset_Float_Box_relation_with_congruence, 376
ppl_Pointset_Powerset_Float_Box_relation_with_constraint, 376
ppl_Pointset_Powerset_Float_Box_relation_with_generator, 376
ppl_Pointset_Powerset_Float_Box_remove_empty_disjuncts, 379
ppl_Pointset_Powerset_Float_Box_remove_space_dimensions, 379
ppl_Pointset_Powerset_Float_Box_simplify_using_context_assign, 378
ppl_Pointset_Powerset_Float_Box_size, 379
ppl_Pointset_Powerset_Float_Box_space_dimension, 376
ppl_Pointset_Powerset_Float_Box_strictly_contains, 377
ppl_Pointset_Powerset_Float_Box_swap, 376
ppl_Pointset_Powerset_Float_Box_upper_bound_assign_if_exact, 378
ppl_Pointset_Powerset_Float_Box_topological_closure_assign, 376
ppl_Pointset_Powerset_Float_Box_total_memory_in_bytes, 379
ppl_Pointset_Powerset_Float_Box_unconstrain_space_dimension, 378
ppl_Pointset_Powerset_Float_Box_unconstrain_space_dimensions, 378
ppl_Pointset_Powerset_Float_Box_upper_bound_assign, 378
ppl_Pointset_Powerset_Grid_add_congruence, 319
ppl_Pointset_Powerset_Grid_add_congruences, 320
ppl_Pointset_Powerset_Grid_add_constraint, 319
ppl_Pointset_Powerset_Grid_add_constraints, 319
ppl_Pointset_Powerset_Grid_add_disjunct, 322

ppl_Pointset_Powerset_Grid_add_space_dimensions_and_embed, 321
ppl_Pointset_Powerset_Grid_add_space_dimensions_and_project, 321
ppl_Pointset_Powerset_Grid_affine_dimension, 318
ppl_Pointset_Powerset_Grid_affine_image, 320
ppl_Pointset_Powerset_Grid_affine_preimage, 320
ppl_Pointset_Powerset_Grid_ascii_dump, 321
ppl_Pointset_Powerset_Grid_begin_iterator, 321
ppl_Pointset_Powerset_Grid_BGP99_conclusion_extrapolation_assign, 322
ppl_Pointset_Powerset_Grid_BGP99_extrapolation_assign, 322
ppl_Pointset_Powerset_Grid_BHZ03_combining_constraints, 322
ppl_Pointset_Powerset_Grid_BHZ03_widening_assign, 322
ppl_Pointset_Powerset_Grid_bounded_affine_image, 320
ppl_Pointset_Powerset_Grid_bounded_affine_preimage, 320
ppl_Pointset_Powerset_Grid_bounds_from_above, 319
ppl_Pointset_Powerset_Grid_bounds_from_below, 319
ppl_Pointset_Powerset_Grid_concatenate_assign, 320
ppl_Pointset_Powerset_Grid_constrains, 320
ppl_Pointset_Powerset_Grid_contains_integer_point, 319
ppl_Pointset_Powerset_Grid_contains_Polyhedron_Powerset_Grid, 319
ppl_Pointset_Powerset_Grid_decrement_iterator, 322
ppl_Pointset_Powerset_Grid_difference_assign, 320
ppl_Pointset_Powerset_Grid_drop_disjunct, 322
ppl_Pointset_Powerset_Grid_drop_disjuncts, 322
ppl_Pointset_Powerset_Grid_drop_some_non_integer_points, 321
ppl_Pointset_Powerset_Grid_drop_some_non_integer_points_2, 321
ppl_Pointset_Powerset_Grid_end_iterator, 321
ppl_Pointset_Powerset_Grid_equals_Pointset_Powerset_Grid, 319
ppl_Pointset_Powerset_Grid_expand_space_dimension, 321
ppl_Pointset_Powerset_Grid_external_memory_in_bytes, 321
ppl_Pointset_Powerset_Grid_fold_space_dimensions, 321
ppl_Pointset_Powerset_Grid_generalized_affine_image, 320
ppl_Pointset_Powerset_Grid_generalized_affine_image_lhs_rhs, 321
ppl_Pointset_Powerset_Grid_generalized_affine_preimage, 321
ppl_Pointset_Powerset_Grid_generalized_affine_preimage_lhs_rhs, 321
ppl_Pointset_Powerset_Grid_geometrically_covers_Grid, 319
ppl_Pointset_Powerset_Grid_geometrically_equals_Grid, 319
ppl_Pointset_Powerset_Grid_get_disjunct, 322
ppl_Pointset_Powerset_Grid_increment_iterator, 321
ppl_Pointset_Powerset_Grid_intersection_assign, 320
ppl_Pointset_Powerset_Grid_is_bounded, 319
ppl_Pointset_Powerset_Grid_is_discrete, 319
ppl_Pointset_Powerset_Grid_is_disjoint_from_Polyhedron, 319
ppl_Pointset_Powerset_Grid_is_empty, 318
ppl_Pointset_Powerset_Grid_is_topologically_closed, 319
ppl_Pointset_Powerset_Grid_is_universe, 318
ppl_Pointset_Powerset_Grid_iterator_equals_iterator, 321
ppl_Pointset_Powerset_Grid_map_space_dimensions, 321
ppl_Pointset_Powerset_Grid_maximize, 319
ppl_Pointset_Powerset_Grid_maximize_with_point, 319
ppl_Pointset_Powerset_Grid_minimize, 319
ppl_Pointset_Powerset_Grid_minimize_with_point, 319
ppl_Pointset_Powerset_Grid_OK, 319
ppl_Pointset_Powerset_Grid_omega_reduce, 319
ppl_Pointset_Powerset_Grid_pairwise_reduce, 319
ppl_Pointset_Powerset_Grid_refine_with_congruence,

320
ppl_Pointset_Powerset_Grid_refine_with_constraint, 320
ppl_Pointset_Powerset_Grid_refine_with_constraints, 320
ppl_Pointset_Powerset_Grid_refine_with_congruence, 320
ppl_Pointset_Powerset_Grid_relation_with_constraint, 318
ppl_Pointset_Powerset_Grid_relation_with_congruence, 318
ppl_Pointset_Powerset_Grid_relation_with_generator, 318
ppl_Pointset_Powerset_Grid_remove_higher_space_dimensions, 321
ppl_Pointset_Powerset_Grid_remove_space_dimensions, 321
ppl_Pointset_Powerset_Grid_simplify_using_context_assign, 320
ppl_Pointset_Powerset_Grid_size, 321
ppl_Pointset_Powerset_Grid_space_dimension, 318
ppl_Pointset_Powerset_Grid_strictly_contains, 319
ppl_Pointset_Powerset_Grid_swap, 318
ppl_Pointset_Powerset_Grid_time_elapse_assign, 320
ppl_Pointset_Powerset_Grid_topological_closure_assign, 319
ppl_Pointset_Powerset_Grid_total_memory_in_bytes, 321
ppl_Pointset_Powerset_Grid_unconstrain, 320
ppl_Pointset_Powerset_Grid_unconstrain_space_dimensions, 320
ppl_Pointset_Powerset_Grid_upper_bound_assign, 320
ppl_Pointset_Powerset_Grid_upper_bound_assign_if_exact, 320
ppl_Pointset_Powerset_Int16_Box_add_constraint, 211
ppl_Pointset_Powerset_Int16_Box_add_constraints, 211
ppl_Pointset_Powerset_Int16_Box_add_constraints_and_minimize, 211
ppl_Pointset_Powerset_Int16_Box_add_disjunct, 214
ppl_Pointset_Powerset_Int16_Box_add_space_dimensions_and_embed, 213
ppl_Pointset_Powerset_Int16_Box_add_space_dimensions_and_project, 213
ppl_Pointset_Powerset_Int16_Box_affine_image, 210
ppl_Pointset_Powerset_Int16_Box_affine_preimage, 212
ppl_Pointset_Powerset_Int16_Box_ascii_dump, 212
ppl_Pointset_Powerset_Int16_Box_begin_iterator, 213
ppl_Pointset_Powerset_Int16_Box_bounded_affine_image, 213
ppl_Pointset_Powerset_Int16_Box_bounded_affine_preimage, 212
ppl_Pointset_Powerset_Int16_Box_bounds_from_above, 212
ppl_Pointset_Powerset_Int16_Box_bounds_from_below, 211
ppl_Pointset_Powerset_Int16_Box_concatenate_assign, 211
ppl_Pointset_Powerset_Int16_Box_constrains, 212
ppl_Pointset_Powerset_Int16_Box_contains_integer_point, 212
ppl_Pointset_Powerset_Int16_Box_contains_Pointset_Powerset_Grid, 210
ppl_Pointset_Powerset_Int16_Box_contains_Pointset_Powerset_Int16_Box, 211
ppl_Pointset_Powerset_Int16_Box_decrement_iterator, 214
ppl_Pointset_Powerset_Int16_Box_difference_assign, 212
ppl_Pointset_Powerset_Int16_Box_drop_disjunct, 214
ppl_Pointset_Powerset_Int16_Box_drop_disjuncts, 214
ppl_Pointset_Powerset_Int16_Box_drop_some_non_integer_points, 213
ppl_Pointset_Powerset_Int16_Box_drop_some_non_integer_points, 213
ppl_Pointset_Powerset_Int16_Box_end_iterator, 214
ppl_Pointset_Powerset_Int16_Box_equals_Pointset_Powerset_Int16_Box, 211
ppl_Pointset_Powerset_Int16_Box_expand_space_dimension, 213
ppl_Pointset_Powerset_Int16_Box_external_memory_in_bytes, 213
ppl_Pointset_Powerset_Int16_Box_fold_space_dimensions, 213
ppl_Pointset_Powerset_Int16_Box_generalized_affine_image, 213
ppl_Pointset_Powerset_Int16_Box_generalized_affine_image_lhs_rhs, 213
ppl_Pointset_Powerset_Int16_Box_generalized_affine_preimage, 213
ppl_Pointset_Powerset_Int16_Box_generalized_affine_preimage_lhs_rhs, 213

ppl_Pointset_Powerset_Int16_Box_geometry_cmp, 213
ppl_Pointset_Powerset_Int16_Box_geometry_equals, 211
ppl_Pointset_Powerset_Int16_Box_get_disjunct, 211
ppl_Pointset_Powerset_Int16_Box_increment, 214
ppl_Pointset_Powerset_Int16_Box_interpolate_assign, 214
ppl_Pointset_Powerset_Int16_Box_is_bounded, 212
ppl_Pointset_Powerset_Int16_Box_is_disjoint_from, 210
ppl_Pointset_Powerset_Int16_Box_is_empty, 211
ppl_Pointset_Powerset_Int16_Box_is_topologically_closed, 210
ppl_Pointset_Powerset_Int16_Box_is_universe, 210
ppl_Pointset_Powerset_Int16_Box_iterator_equals_iterator, 214
ppl_Pointset_Powerset_Int16_Box_map_space_dimensions, 213
ppl_Pointset_Powerset_Int16_Box_maximize, 211
ppl_Pointset_Powerset_Int16_Box_maximize_with_point, 211
ppl_Pointset_Powerset_Int16_Box_minimize, 211
ppl_Pointset_Powerset_Int16_Box_minimize_with_point, 211
ppl_Pointset_Powerset_Int16_Box_OK, 211
ppl_Pointset_Powerset_Int16_Box_omega_reduce, 211
ppl_Pointset_Powerset_Int16_Box_pairwise_reduce, 211
ppl_Pointset_Powerset_Int16_Box_refine_with_congruence, 212
ppl_Pointset_Powerset_Int16_Box_refine_with_congruences, 212
ppl_Pointset_Powerset_Int16_Box_refine_with_constraint, 212
ppl_Pointset_Powerset_Int16_Box_refine_with_constraints, 212
ppl_Pointset_Powerset_Int16_Box_relation_with_congruence, 210
ppl_Pointset_Powerset_Int16_Box_relation_with_constraint, 210
ppl_Pointset_Powerset_Int16_Box_relation_with_generator, 210
ppl_Pointset_Powerset_Int16_Box_remove_higher_space_dimensions, 213
ppl_Pointset_Powerset_Int16_Box_remove_space_dimensions, 213
ppl_Pointset_Powerset_Int16_Box_simplify_using_context, 212
ppl_Pointset_Powerset_Int16_Box_size, 213
ppl_Pointset_Powerset_Int16_Box_space_dimension, 210
ppl_Pointset_Powerset_Int16_Box_strictly_contains, 211
ppl_Pointset_Powerset_Int16_Box_swap, 210
ppl_Pointset_Powerset_Int16_Box_time_elapse_assign, 212
ppl_Pointset_Powerset_Int16_Box_topological_closure_assign, 210
ppl_Pointset_Powerset_Int16_Box_total_memory_in_bytes, 213
ppl_Pointset_Powerset_Int16_Box_unconstrain_space_dimension, 212
ppl_Pointset_Powerset_Int16_Box_unconstrain_space_dimensions, 212
ppl_Pointset_Powerset_Int16_Box_upper_bound_assign, 212
ppl_Pointset_Powerset_Int16_Box_upper_bound_assign_if_exact, 212
ppl_Pointset_Powerset_Int32_Box_add_congruence, 216
ppl_Pointset_Powerset_Int32_Box_add_congruences, 216
ppl_Pointset_Powerset_Int32_Box_add_constraint, 216
ppl_Pointset_Powerset_Int32_Box_add_constraints, 216
ppl_Pointset_Powerset_Int32_Box_add_disjunct, 218
ppl_Pointset_Powerset_Int32_Box_add_space_dimensions_and_embed, 217
ppl_Pointset_Powerset_Int32_Box_add_space_dimensions_and_project, 217
ppl_Pointset_Powerset_Int32_Box_affine_dimension, 214
ppl_Pointset_Powerset_Int32_Box_affine_image, 217
ppl_Pointset_Powerset_Int32_Box_affine_preimage, 217
ppl_Pointset_Powerset_Int32_Box_ascii_dump, 218
ppl_Pointset_Powerset_Int32_Box_begin_iterator, 218
ppl_Pointset_Powerset_Int32_Box_bounded_affine_image, 217

ppl_Pointset_Powerset_Int32_Box_bounded_affine_preimage, 216
ppl_Pointset_Powerset_Int32_Box_bounded_affine_image, 217
ppl_Pointset_Powerset_Int32_Box_bounds_from_above, 217
ppl_Pointset_Powerset_Int32_Box_bounds_from_below, 215
ppl_Pointset_Powerset_Int32_Box_concatenate_assign, 215
ppl_Pointset_Powerset_Int32_Box_constrains, 216
ppl_Pointset_Powerset_Int32_Box_contains_integer_point, 216
ppl_Pointset_Powerset_Int32_Box_contains_Powerset_Int32_Box, 215
ppl_Pointset_Powerset_Int32_Box_decrement, 215
ppl_Pointset_Powerset_Int32_Box_difference_assign, 218
ppl_Pointset_Powerset_Int32_Box_drop_disjuncts, 216
ppl_Pointset_Powerset_Int32_Box_drop_some_disjuncts, 218
ppl_Pointset_Powerset_Int32_Box_drop_some_non_integer_points, 218
ppl_Pointset_Powerset_Int32_Box_end_iterator, 217
ppl_Pointset_Powerset_Int32_Box_equals_Powerset_Int32_Box, 218
ppl_Pointset_Powerset_Int32_Box_expand_dimension, 216
ppl_Pointset_Powerset_Int32_Box_external_memory_in_bytes, 217
ppl_Pointset_Powerset_Int32_Box_fold_space_dimensions, 218
ppl_Pointset_Powerset_Int32_Box_generalized_affine_image, 217
ppl_Pointset_Powerset_Int32_Box_generalized_affine_image_lhs_rhs, 217
ppl_Pointset_Powerset_Int32_Box_generalized_affine_preimage, 217
ppl_Pointset_Powerset_Int32_Box_generalized_affine_preimage_lhs_rhs, 217
ppl_Pointset_Powerset_Int32_Box_geometrically_covers_Powerset_Int32_Box, 216
ppl_Pointset_Powerset_Int32_Box_geometrically_equals_Powerset_Int32_Box, 216
ppl_Pointset_Powerset_Int32_Box_get_disjunct, 218
ppl_Pointset_Powerset_Int32_Box_increment, 218
ppl_Pointset_Powerset_Int32_Box_interpolate_assign, 216
ppl_Pointset_Powerset_Int32_Box_is_bounded, 215
ppl_Pointset_Powerset_Int32_Box_is_discrete, 215
ppl_Pointset_Powerset_Int32_Box_is_disjoint_from_Powerset_Int32_Box, 215
ppl_Pointset_Powerset_Int32_Box_is_empty, 215
ppl_Pointset_Powerset_Int32_Box_is_topologically_closed, 215
ppl_Pointset_Powerset_Int32_Box_is_universe, 215
ppl_Pointset_Powerset_Int32_Box_iterator_equals_iterator, 218
ppl_Pointset_Powerset_Int32_Box_map_space_dimensions, 217
ppl_Pointset_Powerset_Int32_Box_maximize, 215
ppl_Pointset_Powerset_Int32_Box_maximize_with_point, 215
ppl_Pointset_Powerset_Int32_Box_minimize, 215
ppl_Pointset_Powerset_Int32_Box_minimize_with_point, 215
ppl_Pointset_Powerset_Int32_Box_OK, 216
ppl_Pointset_Powerset_Int32_Box_omega_reduce, 215
ppl_Pointset_Powerset_Int32_Box_pairwise_reduce, 215
ppl_Pointset_Powerset_Int32_Box_refine_with_congruence, 216
ppl_Pointset_Powerset_Int32_Box_refine_with_congruences, 216
ppl_Pointset_Powerset_Int32_Box_refine_with_constraint, 216
ppl_Pointset_Powerset_Int32_Box_refine_with_constraints, 216
ppl_Pointset_Powerset_Int32_Box_relation_with_congruence, 215
ppl_Pointset_Powerset_Int32_Box_relation_with_constraint, 214
ppl_Pointset_Powerset_Int32_Box_relation_with_generator, 214
ppl_Pointset_Powerset_Int32_Box_remove_higher_space_dimensions, 217
ppl_Pointset_Powerset_Int32_Box_remove_space_dimensions, 217
ppl_Pointset_Powerset_Int32_Box_simplify_using_context_assign, 216
ppl_Pointset_Powerset_Int32_Box_size, 218
ppl_Pointset_Powerset_Int32_Box_space_dimension, 218

ppl_Pointset_Powerset_Int32_Box_strictly_contains_Pointset_Powerset_Int32_Box_integer 214
ppl_Pointset_Powerset_Int32_Box_swap 215
ppl_Pointset_Powerset_Int32_Box_time_elapse_assign 214
ppl_Pointset_Powerset_Int32_Box_topological_closure_assign 216
ppl_Pointset_Powerset_Int32_Box_total_memory_in_bytes 215
ppl_Pointset_Powerset_Int32_Box_unconstrain_space_dimension 218
ppl_Pointset_Powerset_Int32_Box_unconstrain_space_dimensions 217
ppl_Pointset_Powerset_Int32_Box_upper_bound_assign 217
ppl_Pointset_Powerset_Int32_Box_upper_bound_assign_if_exact 216
ppl_Pointset_Powerset_Int64_Box_add_constraint 216
ppl_Pointset_Powerset_Int64_Box_add_constraints 220
ppl_Pointset_Powerset_Int64_Box_add_constraints_and_minimize 220
ppl_Pointset_Powerset_Int64_Box_add_constraints_and_minimize_with_point 220
ppl_Pointset_Powerset_Int64_Box_add_constraints_with_point 220
ppl_Pointset_Powerset_Int64_Box_add_disjunct 222
ppl_Pointset_Powerset_Int64_Box_add_space_dimensions_and_embed 222
ppl_Pointset_Powerset_Int64_Box_add_space_dimensions_and_project 222
ppl_Pointset_Powerset_Int64_Box_affine_form_image 219
ppl_Pointset_Powerset_Int64_Box_affine_image 221
ppl_Pointset_Powerset_Int64_Box_affine_preimage 221
ppl_Pointset_Powerset_Int64_Box_ascii_dump 222
ppl_Pointset_Powerset_Int64_Box_begin_iterator 222
ppl_Pointset_Powerset_Int64_Box_bounded_affine_image 221
ppl_Pointset_Powerset_Int64_Box_bounded_affine_preimage 221
ppl_Pointset_Powerset_Int64_Box_bounds_from_above 219
ppl_Pointset_Powerset_Int64_Box_bounds_from_below 219
ppl_Pointset_Powerset_Int64_Box_concatenate_assign 221
ppl_Pointset_Powerset_Int64_Box_constrains 221
ppl_Pointset_Powerset_Int64_Box_contains_Pointset_Powerset_Int32_Box_integer 219
ppl_Pointset_Powerset_Int64_Box_contains_Pointset 220
ppl_Pointset_Powerset_Int64_Box_decrement_iterator 222
ppl_Pointset_Powerset_Int64_Box_difference_assign 221
ppl_Pointset_Powerset_Int64_Box_drop_disjunct 223
ppl_Pointset_Powerset_Int64_Box_drop_disjuncts 223
ppl_Pointset_Powerset_Int64_Box_drop_some_non_integer_disjuncts 222
ppl_Pointset_Powerset_Int64_Box_drop_some_non_integer_disjuncts_preserving_semantics 222
ppl_Pointset_Powerset_Int64_Box_end_iterator 222
ppl_Pointset_Powerset_Int64_Box_equals_Pointset_Powerset_Int64_Box 220
ppl_Pointset_Powerset_Int64_Box_expand_space_dimension 222
ppl_Pointset_Powerset_Int64_Box_external_memory_in_bytes 222
ppl_Pointset_Powerset_Int64_Box_fold_space_dimensions 222
ppl_Pointset_Powerset_Int64_Box_generalized_affine_form_image 221
ppl_Pointset_Powerset_Int64_Box_generalized_affine_image 221
ppl_Pointset_Powerset_Int64_Box_generalized_affine_image_lhs_rhs 221
ppl_Pointset_Powerset_Int64_Box_generalized_affine_preimage 222
ppl_Pointset_Powerset_Int64_Box_geometrically_covers_Pointset_Powerset_Int64_Box 220
ppl_Pointset_Powerset_Int64_Box_geometrically_equals_Pointset_Powerset_Int64_Box 220
ppl_Pointset_Powerset_Int64_Box_get_disjunct 222
ppl_Pointset_Powerset_Int64_Box_increment_iterator 222
ppl_Pointset_Powerset_Int64_Box_intersection_assign 220
ppl_Pointset_Powerset_Int64_Box_is_bounded 219
ppl_Pointset_Powerset_Int64_Box_is_discrete 219
ppl_Pointset_Powerset_Int64_Box_is_disjoint_from_Pointset_Powerset_Int64_Box 220
ppl_Pointset_Powerset_Int64_Box_is_empty 219
ppl_Pointset_Powerset_Int64_Box_is_topologically_closed 220

219
ppl_Pointset_Powerset_Int64_Box_is_universe,
219
ppl_Pointset_Powerset_Int64_Box_iterator_equals_iterator,
222
ppl_Pointset_Powerset_Int64_Box_map_space_dimensions,
222
ppl_Pointset_Powerset_Int64_Box_maximize,
219
ppl_Pointset_Powerset_Int64_Box_maximize_with_point,
220
ppl_Pointset_Powerset_Int64_Box_minimize,
219
ppl_Pointset_Powerset_Int64_Box_minimize_with_point,
220
ppl_Pointset_Powerset_Int64_Box_OK,
220
ppl_Pointset_Powerset_Int64_Box_omega_reduce,
219
ppl_Pointset_Powerset_Int64_Box_pairwise_reduce,
219
ppl_Pointset_Powerset_Int64_Box_refine_with_congruence,
220
ppl_Pointset_Powerset_Int64_Box_refine_with_congruences,
220
ppl_Pointset_Powerset_Int64_Box_refine_with_constraint,
220
ppl_Pointset_Powerset_Int64_Box_refine_with_constraints,
220
ppl_Pointset_Powerset_Int64_Box_relation_with_congruence,
219
ppl_Pointset_Powerset_Int64_Box_relation_with_constraint,
219
ppl_Pointset_Powerset_Int64_Box_relation_with_generator,
219
ppl_Pointset_Powerset_Int64_Box_remove_higher_space_dimensions,
222
ppl_Pointset_Powerset_Int64_Box_remove_space_dimensions,
222
ppl_Pointset_Powerset_Int64_Box_simplify_using_context_assign,
221
ppl_Pointset_Powerset_Int64_Box_size,
222
ppl_Pointset_Powerset_Int64_Box_space_dimension,
219
ppl_Pointset_Powerset_Int64_Box_strictly_contains,
220
ppl_Pointset_Powerset_Int64_Box_swap,
219
ppl_Pointset_Powerset_Int64_Box_time_elapse_assign,
221
ppl_Pointset_Powerset_Int64_Box_topological_closure_assign,
219
ppl_Pointset_Powerset_Int64_Box_total_memory_in_bytes,
222
ppl_Pointset_Powerset_Int64_Box_unconstrain_space,
221
ppl_Pointset_Powerset_Int64_Box_unconstrain_space,
221
ppl_Pointset_Powerset_Int64_Box_upper_bound_assign,
220
ppl_Pointset_Powerset_Int64_Box_upper_bound_assign,
221
ppl_Pointset_Powerset_Int8_Box_add_congruence,
207
ppl_Pointset_Powerset_Int8_Box_add_congruences,
207
ppl_Pointset_Powerset_Int8_Box_add_constraint,
207
ppl_Pointset_Powerset_Int8_Box_add_constraints,
207
ppl_Pointset_Powerset_Int8_Box_add_disjunct,
209
ppl_Pointset_Powerset_Int8_Box_add_space_dimensions_and_embed,
208
ppl_Pointset_Powerset_Int8_Box_add_space_dimensions_and_project,
208
ppl_Pointset_Powerset_Int8_Box_affine_dimension,
206
ppl_Pointset_Powerset_Int8_Box_affine_image,
208
ppl_Pointset_Powerset_Int8_Box_affine_preimage,
208
ppl_Pointset_Powerset_Int8_Box_ascii_dump,
209
ppl_Pointset_Powerset_Int8_Box_begin_iterator,
209
ppl_Pointset_Powerset_Int8_Box_bounded_affine_image,
208
ppl_Pointset_Powerset_Int8_Box_bounded_affine_preimage,
208
ppl_Pointset_Powerset_Int8_Box_bounds_from_above,
206
ppl_Pointset_Powerset_Int8_Box_bounds_from_below,
206
ppl_Pointset_Powerset_Int8_Box_concatenate_assign,
208
ppl_Pointset_Powerset_Int8_Box_constrains,
208
ppl_Pointset_Powerset_Int8_Box_contains_Integer_Point,
206
ppl_Pointset_Powerset_Int8_Box_contains_Pointset_Powerset_Int8_Box,
207
ppl_Pointset_Powerset_Int8_Box_decrement_iterator,
209
ppl_Pointset_Powerset_Int8_Box_difference_assign,
207
ppl_Pointset_Powerset_Int8_Box_drop_disjunct,

ppl_Pointset_Powerset_Int8_Box_drop_disjuncts, 209
ppl_Pointset_Powerset_Int8_Box_drop_some_non_integer_points, 210
ppl_Pointset_Powerset_Int8_Box_drop_some_points, 209
ppl_Pointset_Powerset_Int8_Box_end_iterator, 209
ppl_Pointset_Powerset_Int8_Box_equals, 209
ppl_Pointset_Powerset_Int8_Box_expand_space_dimension, 207
ppl_Pointset_Powerset_Int8_Box_external_memory_in_bytes, 209
ppl_Pointset_Powerset_Int8_Box_fold_space_dimensions, 209
ppl_Pointset_Powerset_Int8_Box_generalized_affine_image, 209
ppl_Pointset_Powerset_Int8_Box_generalized_affine_image_lhs_rhs, 208
ppl_Pointset_Powerset_Int8_Box_generalized_affine_preimage, 208
ppl_Pointset_Powerset_Int8_Box_generalized_affine_preimage_lhs_rhs, 208
ppl_Pointset_Powerset_Int8_Box_geometrically_covers, 208
ppl_Pointset_Powerset_Int8_Box_geometrically_equals, 207
ppl_Pointset_Powerset_Int8_Box_get_disjunct, 207
ppl_Pointset_Powerset_Int8_Box_increment_iterator, 209
ppl_Pointset_Powerset_Int8_Box_intersection_assign, 209
ppl_Pointset_Powerset_Int8_Box_is_bounded, 207
ppl_Pointset_Powerset_Int8_Box_is_disjoint_from, 206
ppl_Pointset_Powerset_Int8_Box_is_disjoint_from_int8_box, 206
ppl_Pointset_Powerset_Int8_Box_is_empty, 207
ppl_Pointset_Powerset_Int8_Box_is_topologically_closed, 206
ppl_Pointset_Powerset_Int8_Box_is_universe, 206
ppl_Pointset_Powerset_Int8_Box_iterator_equals_iterator, 206
ppl_Pointset_Powerset_Int8_Box_map_space_dimensions, 209
ppl_Pointset_Powerset_Int8_Box_maximize, 206
ppl_Pointset_Powerset_Int8_Box_maximize_with_point, 206
ppl_Pointset_Powerset_Int8_Box_minimize, 206
ppl_Pointset_Powerset_Int8_Box_minimize_with_point, 206
ppl_Pointset_Powerset_Int8_Box_OK, 207
ppl_Pointset_Powerset_Int8_Box_omega_reduce, 207
ppl_Pointset_Powerset_Int8_Box_pairwise_reduce, 206
ppl_Pointset_Powerset_Int8_Box_refine_with_congruence, 207
ppl_Pointset_Powerset_Int8_Box_refine_with_congruences, 207
ppl_Pointset_Powerset_Int8_Box_refine_with_constraint, 207
ppl_Pointset_Powerset_Int8_Box_refine_with_constraints, 207
ppl_Pointset_Powerset_Int8_Box_relation_with_congruence, 206
ppl_Pointset_Powerset_Int8_Box_relation_with_constraint, 206
ppl_Pointset_Powerset_Int8_Box_relation_with_generator, 206
ppl_Pointset_Powerset_Int8_Box_remove_higher_space_dimensions, 209
ppl_Pointset_Powerset_Int8_Box_remove_space_dimensions, 209
ppl_Pointset_Powerset_Int8_Box_simplify_using_context, 208
ppl_Pointset_Powerset_Int8_Box_size, 209
ppl_Pointset_Powerset_Int8_Box_space_dimension, 206
ppl_Pointset_Powerset_Int8_Box_strictly_contains, 207
ppl_Pointset_Powerset_Int8_Box_swap, 206
ppl_Pointset_Powerset_Int8_Box_time_elapse_assign, 208
ppl_Pointset_Powerset_Int8_Box_topological_closure_assign, 206
ppl_Pointset_Powerset_Int8_Box_total_memory_in_bytes, 209
ppl_Pointset_Powerset_Int8_Box_unconstrain_space_dimension, 208
ppl_Pointset_Powerset_Int8_Box_unconstrain_space_dimensions, 208
ppl_Pointset_Powerset_Int8_Box_upper_bound_assign, 207
ppl_Pointset_Powerset_Int8_Box_upper_bound_assign_if_exact, 208
ppl_Pointset_Powerset_Long_Double_Box_add_congruence, 206

ppl_Pointset_Powerset_Long_Double_Box_add_constraint, 453
ppl_Pointset_Powerset_Long_Double_Box_add_constraints, 453
ppl_Pointset_Powerset_Long_Double_Box_add_constraints_and_minimize, 453
ppl_Pointset_Powerset_Long_Double_Box_add_disjunct, 453
ppl_Pointset_Powerset_Long_Double_Box_add_space_dimensions_and_embed, 455
ppl_Pointset_Powerset_Long_Double_Box_add_space_dimensions_and_project, 454
ppl_Pointset_Powerset_Long_Double_Box_affine_form_image, 454
ppl_Pointset_Powerset_Long_Double_Box_affine_image, 451
ppl_Pointset_Powerset_Long_Double_Box_affine_preimage, 454
ppl_Pointset_Powerset_Long_Double_Box_append, 454
ppl_Pointset_Powerset_Long_Double_Box_ascii_dump, 454
ppl_Pointset_Powerset_Long_Double_Box_begin_iterator, 455
ppl_Pointset_Powerset_Long_Double_Box_bounded_affine_image, 455
ppl_Pointset_Powerset_Long_Double_Box_bounded_affine_preimage, 454
ppl_Pointset_Powerset_Long_Double_Box_bounds_from_above, 454
ppl_Pointset_Powerset_Long_Double_Box_bounds_from_below, 452
ppl_Pointset_Powerset_Long_Double_Box_can_recycle_powerset, 452
ppl_Pointset_Powerset_Long_Double_Box_concatenate_assign, 452
ppl_Pointset_Powerset_Long_Double_Box_contains, 453
ppl_Pointset_Powerset_Long_Double_Box_contains_integer_point, 454
ppl_Pointset_Powerset_Long_Double_Box_CP_Box_CP_Box_reduction_with_pointset, 452
ppl_Pointset_Powerset_Long_Double_Box_deep_copy, 455
ppl_Pointset_Powerset_Long_Double_Box_difference_assign, 455
ppl_Pointset_Powerset_Long_Double_Box_drop_disjunct, 453
ppl_Pointset_Powerset_Long_Double_Box_drop_some_non_integer_points, 455
ppl_Pointset_Powerset_Long_Double_Box_end_iterator, 455
ppl_Pointset_Powerset_Long_Double_Box_equals_Pointset_Powerset_Long_Double_Box, 455
ppl_Pointset_Powerset_Long_Double_Box_expand_space_dimension, 453
ppl_Pointset_Powerset_Long_Double_Box_external_memory_in_bytes, 454
ppl_Pointset_Powerset_Long_Double_Box_fold_space_dimensions, 454
ppl_Pointset_Powerset_Long_Double_Box_generalized_affine_image, 454
ppl_Pointset_Powerset_Long_Double_Box_generalized_affine_image_lhs_rhs, 454
ppl_Pointset_Powerset_Long_Double_Box_generalized_affine_preimage, 454
ppl_Pointset_Powerset_Long_Double_Box_generalized_affine_preimage_lhs_rhs, 454
ppl_Pointset_Powerset_Long_Double_Box_geometrically_covers, 454
ppl_Pointset_Powerset_Long_Double_Box_geometrically_equals, 453
ppl_Pointset_Powerset_Long_Double_Box_get_disjunct, 455
ppl_Pointset_Powerset_Long_Double_Box_increment_iterator, 455
ppl_Pointset_Powerset_Long_Double_Box_intersection_assign, 454
ppl_Pointset_Powerset_Long_Double_Box_is_bounded, 454
ppl_Pointset_Powerset_Long_Double_Box_is_discrete, 452
ppl_Pointset_Powerset_Long_Double_Box_is_disjoint_from_Box, 452
ppl_Pointset_Powerset_Long_Double_Box_is_empty, 453
ppl_Pointset_Powerset_Long_Double_Box_is_topologically_closed, 454
ppl_Pointset_Powerset_Long_Double_Box_is_universe, 452
ppl_Pointset_Powerset_Long_Double_Box_iterator_equals_iterator, 452
ppl_Pointset_Powerset_Long_Double_Box_map_space_dimensions, 455
ppl_Pointset_Powerset_Long_Double_Box_maximize, 455
ppl_Pointset_Powerset_Long_Double_Box_maximize_with_witness, 453
ppl_Pointset_Powerset_Long_Double_Box_minimize, 455
ppl_Pointset_Powerset_Long_Double_Box_minimize_with_witness, 455
ppl_Pointset_Powerset_Long_Double_Box_OK, 455
ppl_Pointset_Powerset_Long_Double_Box_omega_reduce, 455
ppl_Pointset_Powerset_Long_Double_Box_pairwise_reduce, 453

ppl_Pointset_Powerset_Long_Double_Box 452
ppl_Pointset_Powerset_Long_Double_Box 453
ppl_Pointset_Powerset_Long_Double_Box 453
ppl_Pointset_Powerset_Long_Double_Box 453
ppl_Pointset_Powerset_Long_Double_Box 453
ppl_Pointset_Powerset_Long_Double_Box 451
ppl_Pointset_Powerset_Long_Double_Box 451
ppl_Pointset_Powerset_Long_Double_Box 451
ppl_Pointset_Powerset_Long_Double_Box 454
ppl_Pointset_Powerset_Long_Double_Box 454
ppl_Pointset_Powerset_Long_Double_Box 454
ppl_Pointset_Powerset_Long_Double_Box 455
ppl_Pointset_Powerset_Long_Double_Box 451
ppl_Pointset_Powerset_Long_Double_Box 452
ppl_Pointset_Powerset_Long_Double_Box 451
ppl_Pointset_Powerset_Long_Double_Box 453
ppl_Pointset_Powerset_Long_Double_Box 452
ppl_Pointset_Powerset_Long_Double_Box 455
ppl_Pointset_Powerset_Long_Double_Box 454
ppl_Pointset_Powerset_Long_Double_Box 454
ppl_Pointset_Powerset_Long_Double_Box 453
ppl_Pointset_Powerset_Long_Double_Box 453
ppl_Pointset_Powerset_NNC_Polyhedron 315
ppl_Pointset_Powerset_NNC_Polyhedron 315
ppl_Pointset_Powerset_NNC_Polyhedron 315
ppl_Pointset_Powerset_NNC_Polyhedron 315
ppl_Pointset_Powerset_NNC_Polyhedron 317
ppl_Pointset_Powerset_NNC_Polyhedron 316
ppl_Pointset_Powerset_NNC_Polyhedron 317
ppl_Pointset_Powerset_NNC_Polyhedron 313
ppl_Pointset_Powerset_NNC_Polyhedron 316
ppl_Pointset_Powerset_NNC_Polyhedron 316
ppl_Pointset_Powerset_NNC_Polyhedron 317
ppl_Pointset_Powerset_NNC_Polyhedron 317
ppl_Pointset_Powerset_NNC_Polyhedron 318
ppl_Pointset_Powerset_NNC_Polyhedron 318
ppl_Pointset_Powerset_NNC_Polyhedron 318
ppl_Pointset_Powerset_NNC_Polyhedron 318
ppl_Pointset_Powerset_NNC_Polyhedron 316
ppl_Pointset_Powerset_NNC_Polyhedron 316
ppl_Pointset_Powerset_NNC_Polyhedron 314
ppl_Pointset_Powerset_NNC_Polyhedron 314
ppl_Pointset_Powerset_NNC_Polyhedron 316
ppl_Pointset_Powerset_NNC_Polyhedron 316
ppl_Pointset_Powerset_NNC_Polyhedron 314
ppl_Pointset_Powerset_NNC_Polyhedron 314
ppl_Pointset_Powerset_NNC_Polyhedron 317
ppl_Pointset_Powerset_NNC_Polyhedron 315
ppl_Pointset_Powerset_NNC_Polyhedron 318
ppl_Pointset_Powerset_NNC_Polyhedron 318
ppl_Pointset_Powerset_NNC_Polyhedron 317
ppl_Pointset_Powerset_NNC_Polyhedron 317
ppl_Pointset_Powerset_NNC_Polyhedron 317
ppl_Pointset_Powerset_NNC_Polyhedron 315

317 315
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_refine_with_
317 315
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_refine_with_
317 315
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_refine_with_
316 315
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_relation_wit
316 314
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_relation_wit
316 314
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_relation_wit
315 317
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_remove_
315 317
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_remove_
317 316
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_simplify_usi
317 317
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_size,
317 317
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_space_dimens
315 313
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_strictly_con
314 315
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_swap,
314 313
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_
315 316
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_topological_
314 314
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_total_memory
314 317
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_unconstrain
314 316
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_unconstrain_
317 316
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_upper_bound_
317 315
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_NNC_Polyhedron_upper_bound_
314 316
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_Octagonal_Shape_double_add_
314 423
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_Octagonal_Shape_double_add_
314 424
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_Octagonal_Shape_double_add_
314 423
ppl_Pointset_Powerset_NNC_Polyhedron_operator_Pointset_Powerset_Octagonal_Shape_double_add_
315 423
ppl_Pointset_Powerset_NNC_Polyhedron_operator_Pointset_Powerset_Octagonal_Shape_double_add_
314 426
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_Octagonal_Shape_double_add_
314 425
ppl_Pointset_Powerset_NNC_Polyhedron_ppl_Pointset_Powerset_Octagonal_Shape_double_add_

ppl_Pointset_Powerset_Octagonal_Shape_double_affine_preimage, 425
ppl_Pointset_Powerset_Octagonal_Shape_double_affine_image, 425
ppl_Pointset_Powerset_Octagonal_Shape_double_affine_form_image, 425
ppl_Pointset_Powerset_Octagonal_Shape_double_add_space_dimensions_and_embed, 425
ppl_Pointset_Powerset_Octagonal_Shape_double_add_constraints, 422
ppl_Pointset_Powerset_Octagonal_Shape_double_add_constraint, 425
ppl_Pointset_Powerset_Octagonal_Shape_double_add_recycled_constraints, 424
ppl_Pointset_Powerset_Octagonal_Shape_double_add_recycled_constraint, 425
ppl_Pointset_Powerset_Octagonal_Shape_double_add_generators, 423
ppl_Pointset_Powerset_Octagonal_Shape_double_add_recycled_generators, 423
ppl_Pointset_Powerset_Octagonal_Shape_double_get_BGP99_extrapolation_assign, 426
ppl_Pointset_Powerset_Octagonal_Shape_double_get_BHZ03_widening_assign, 426
ppl_Pointset_Powerset_Octagonal_Shape_double_get_H79_widening_assign, 426
ppl_Pointset_Powerset_Octagonal_Shape_double_get_limited_BHZ03_extrapolation_assign, 426
ppl_Pointset_Powerset_Octagonal_Shape_double_get_limited_H79_widening_assign, 426
ppl_Pointset_Powerset_Octagonal_Shape_double_get_limited_extrapolation_assign, 426
ppl_Pointset_Powerset_Octagonal_Shape_double_get_narrowing_iterator, 425
ppl_Pointset_Powerset_Octagonal_Shape_double_get_widening_iterator, 424
ppl_Pointset_Powerset_Octagonal_Shape_double_get_extrapolation_iterator, 425
ppl_Pointset_Powerset_Octagonal_Shape_double_get_disjuncts, 422
ppl_Pointset_Powerset_Octagonal_Shape_double_get_constraints, 423
ppl_Pointset_Powerset_Octagonal_Shape_double_get_constraint, 423
ppl_Pointset_Powerset_Octagonal_Shape_double_get_generators, 424
ppl_Pointset_Powerset_Octagonal_Shape_double_get_congruences, 424
ppl_Pointset_Powerset_Octagonal_Shape_double_get_congruence, 422
ppl_Pointset_Powerset_Octagonal_Shape_double_get_bounding_box, 422
ppl_Pointset_Powerset_Octagonal_Shape_double_get_boolean_operator, 423
ppl_Pointset_Powerset_Octagonal_Shape_double_get_BD_Shape_double, 426
ppl_Pointset_Powerset_Octagonal_Shape_double_get_BD_Shape_double_2, 426
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Box_double, 425
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Box_double_2, 424
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Box_double_3, 423
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Box_double_4, 423
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Box_double_5, 423
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Box_double_6, 423
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Box_double_7, 423
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Box_double_8, 423
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Box_double_OK, 423
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Powerset, 422
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Pointset_Powerset_Octagonal_Shape_double, 422
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Octagonal_Shape_double, 424
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Octagonal_Shape_double_2, 424
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Octagonal_Shape_double_3, 424
ppl_Pointset_Powerset_Octagonal_Shape_double_get_Octagonal_Shape_double_4, 424

ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_minimized_constraints, 424
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_minimized_generators, 422
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_non_redundant_generators, 422
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_non_redundant_generators_and_strictness_flags, 422
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_recession_basis, 425
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_reduced_constraints, 425
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_simplified_constraints, 424
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_size, 425
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_space_dimension, 422
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_strictness, 423
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_swap, 422
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_time_elapse_status, 424
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_topology, 422
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_get_widening_tokens, 425
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_grid_preimage_affine_image, 424
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_grid_preimage_generalized_affine_image, 424
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_grid_preimage_generalized_affine_image_lhs_rhs, 424
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_grid_preimage_image, 424
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_has_equality_saturating_constraint_in_dimension, 387
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_has_lower_bound, 387
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_has_upper_bound, 387
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_has_upper_bound_sp, 387
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_intersection_assign, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_intersection_assign_and_minimize, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_intersection_assign_and_minimize_lhs_rhs, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_intersection_assign_lhs_rhs, 385
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_is_bounded, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_is_disjoint_from, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_is_empty, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_is_universe, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_is_variable_bounded, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_max_min, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_max_min_sp, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_maximize, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_maximize_sp, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_minimize, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_minimize_sp, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_minimized_constraints_are_up_to_date, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_minimized_generators_are_up_to_date, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_OK, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_poly_difference_assign, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_poly_difference_assign_lhs_rhs, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_poly_hull_assign, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_poly_hull_assign_and_minimize, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_poly_hull_assign_and_minimize_lhs_rhs, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_poly_hull_assign_lhs_rhs, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_relation_with, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_relation_with_constraint, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_relation_with_generator, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_remove_higher_space_dimensions, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_remove_space_dimensions, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_remove_universe_space_dimensions, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_simplify_using_context_assign, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_size, 386
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_space_dimension, 386
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_strictly_contains_generator, 387
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_swap, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_time_elapse_assign, 386
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_topological_closure_assign, 386
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_unconstrain, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_unconstrain_space_dimensions, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_upper_bound_assign, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_upper_bound_assign_ref, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_upper_bound_assign_sp, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_upper_bound_assign_sp_ref, 388
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_wrap_assign, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Polyhedron_wrap_assign_ref, 389
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_add_disjunct, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_add_disjunct_preserve_reduction, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_add_disjunct_preserve_reduction_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_add_disjunct_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_add_non_bottom_disjunct, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_add_non_bottom_disjunct_preserve_reduction, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_add_non_bottom_disjunct_preserve_reduction_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_add_non_bottom_disjunct_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_add_space_dimensions_and_embed, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_add_space_dimensions_and_project, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_affine_preimage, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_affine_preimage_lhs_rhs, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_affine_preimage_with_pointset, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_affine_preimage_with_pointset_lhs_rhs, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_BHZ03_widening_assign, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_BHZ03_widening_assign_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_BGP99_extrapolation_assign, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_BGP99_extrapolation_assign_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_collapse_preserve_lub, 393
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_collapse_with_pointset_preserve_lub, 393
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_collapse_with_pointset_to_size, 393
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_collapse_to_size, 393
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_concatenate_assign, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_disjunct, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_disjuncts, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_disjuncts_preserve_reduction, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_disjuncts_preserve_reduction_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_disjuncts_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_disjunct_preserve_reduction, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_disjunct_preserve_reduction_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_disjunct_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_non_bottom_disjunct, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_non_bottom_disjunct_preserve_reduction, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_non_bottom_disjunct_preserve_reduction_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_non_bottom_disjunct_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_non_bottom_disjuncts, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_non_bottom_disjuncts_preserve_reduction, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_non_bottom_disjuncts_preserve_reduction_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_non_bottom_disjuncts_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_drop_to_size, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_elementwise_difference_assign, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_elementwise_difference_assign_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_elementwise_intersection_assign, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_elementwise_intersection_assign_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_elementwise_simplify_using_context_assign, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_elementwise_simplify_using_context_assign_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_elementwise_union_assign, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_elementwise_union_assign_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_equality_preserving_extrapolation_assign, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_equality_preserving_extrapolation_assign_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_expand_dimension, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_fold_space_dimensions, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_preimage, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_preimage_lhs_rhs, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_preimage_with_pointset, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_preimage_with_pointset_lhs_rhs, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_image, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_image_lhs_rhs, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_image_with_pointset, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_image_with_pointset_lhs_rhs, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_disjunct, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_disjunct_preserve_reduction, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_disjunct_preserve_reduction_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_disjunct_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_non_bottom_disjunct, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_non_bottom_disjunct_preserve_reduction, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_non_bottom_disjunct_preserve_reduction_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_non_bottom_disjunct_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_non_bottom_disjuncts, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_non_bottom_disjuncts_preserve_reduction, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_non_bottom_disjuncts_preserve_reduction_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_non_bottom_disjuncts_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_space_dimension, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_space_dimension_preserve_reduction, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_space_dimension_preserve_reduction_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_get_space_dimension_with_pointset, 390
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_intersection_assign, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_intersection_assign_with_pointset, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_bounded, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_bounded_preserve_reduction, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_bounded_preserve_reduction_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_bounded_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_disjoint_from, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_disjoint_from_preserve_reduction, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_disjoint_from_preserve_reduction_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_disjoint_from_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_empty, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_empty_preserve_reduction, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_empty_preserve_reduction_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_empty_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_universe, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_universe_preserve_reduction, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_universe_preserve_reduction_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_is_universe_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_max_min, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_max_min_preserve_reduction, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_max_min_preserve_reduction_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_max_min_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_maximize, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_maximize_preserve_reduction, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_maximize_preserve_reduction_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_maximize_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_minimize, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_minimize_preserve_reduction, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_minimize_preserve_reduction_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_minimize_with_pointset, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_OK, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_pairwise_reduce, 393
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_pairwise_reduce_with_pointset, 393
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_poly_difference_assign, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_poly_difference_assign_with_pointset, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_poly_hull_assign, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_poly_hull_assign_and_minimize, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_poly_hull_assign_and_minimize_with_pointset, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_poly_hull_assign_with_pointset, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_relation_with, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_relation_with_constraint, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_relation_with_generator, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_remove_higher_space_dimensions, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_remove_space_dimensions, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_remove_universe_space_dimensions, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_size, 393
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_space_dimension, 393
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_time_elapse_assign, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_topological_closure_assign, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_unconstrain, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_unconstrain_space_dimensions, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_upper_bound_assign, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_upper_bound_assign_ref, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_upper_bound_assign_with_pointset, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_upper_bound_assign_with_pointset_ref, 391
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_wrap_assign, 392
ppl_Pointset_Powerset_Octagonal_Shape_ppl_Pointset_Powerset_C_Polyhedron_wrap_assign_ref, 392

388 385
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_remo
386 388
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_remo
386 388
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_simp
389 387
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_size,
389 389
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_spac
387 385
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_stri
386 386
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_swap,
386 385
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_Octag
386 387
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_topo
385 386
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_total
386 389
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_uncon
385 388
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_uncon
389 388
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_uppe
388 387
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_float_uppe
386 387
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_ad
386 286
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_ad
386 286
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_ad
386 286
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_ad
387 286
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_ad
386 288
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_ad
386 287
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_ad
387 287
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_af
387 284
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_af
387 287
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_af
387 287
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_as
385 288
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_be
385 288
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_BG

288 288
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_inc
288 288
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_int
287 286
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is
287 284
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is
285 285
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is
285 285
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is
286 284
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is
286 284
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is
284 284
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_li
285 288
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_ma
288 287
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_ma
286 285
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_ma
288 285
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_mi
288 285
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_mi
287 285
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_OK
288 285
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_ome
288 285
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_Sha
285 285
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_re
287 286
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_re
288 286
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_re
287 286
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_re
287 286
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_re
287 284
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_re
287 284
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_re
285 287
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_re
285 287
ppl_Pointset_Powerset_Octagonal_Shape ppl_Pointset_Powerset_Octagonal_Shape_int16_t_si

ppl_Pointset_Powerset_Octagonal_Shape_int32_t_bou 286
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_bou 288
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_bou 284
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_cop 285
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_cop 284
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_cop 286
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_cop 285
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_ded 288
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_dif 286
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_dro 286
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_dro 286
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_dro 286
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_dro 286
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_dro 290
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_enc 291
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_equ 290
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_exp 291
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_ext 293
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_fol 292
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_ger 292
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_ger 289
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_ger 291
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_ger 292
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_geo 292
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_geo 293
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_get 293
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_ind 293
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_int 292
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_ 292
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_siz 292
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_spa 290
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_str 290
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_swa 291
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_tim 289
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_top 290
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_tot 293
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_upp 291
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_upp 293
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_upp 293
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_upp 292
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_wra 292
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_wra 292
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bou 286
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bou 288
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bou 284
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_cop 285
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_cop 284
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_cop 286
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_cop 285
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_ded 288
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_dif 286
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_dro 286
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_dro 286
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_dro 286
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_dro 286
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_dro 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_enc 291
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_equ 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_exp 291
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_ext 293
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_fol 292
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_ger 292
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_ger 289
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_ger 291
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_ger 292
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_geo 292
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_geo 293
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_get 293
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_ind 293
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_int 292
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_ 292
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_siz 292
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_spa 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_str 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_swa 291
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_tim 289
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_top 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_tot 293
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_upp 291
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_upp 293
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_upp 293
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_upp 292
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_wra 292
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_wra 292

ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_bounded, 289
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_discrete, 289
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_empty, 289
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_topologically_closed, 289
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_universe, 289
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_iterator_equals_iterator, 293
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_map_space_dimensions, 292
ppl_Pointset_Powerset_Octagonal_Shape_int32_t_max_min, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_constraint, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_constraint_2, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_constraints, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_constraints_2, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_dimensions_and_embed, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_dimensions_and_project, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_recycled_constraints, 291
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_recycled_constraints_2, 291
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_recycled_constraints_vec, 291
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_ascii_dump, 289
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bounded_affine_image, 289
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bounded_affine_preimage, 289
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bounds_from_above, 292
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bounds_from_below, 291
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_BGP99_extrapolation_assign, 293
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_BHZ03_widening_assign, 295
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_boxed_BGP99_extrapolation_assign, 289
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_boxed_CC92_extrapolation_assign, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_boxed_H79_extrapolation_assign, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_boxed_H79_widening_assign, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_2, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_3, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_4, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_5, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_6, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_7, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_8, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_9, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_10, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_11, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_12, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_13, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_14, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_15, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_16, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_17, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_18, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_19, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_20, 290
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_CC92_extrapolation_assign_21, 290

ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_empty, 296
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_universe, 296
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_topologically_closed, 294
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_bounded, 295
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_map_space_dimensions, 298
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_max_min, 296
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_max_min_2, 298
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_minimized_constraints, 298
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_minimized_generators, 297
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_OK, 297
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_omega_reduce, 298
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_partial_function, 295
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_remove_higher_space_dimensions, 297
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_remove_space_dimensions, 297
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_remove_universal_space_dimensions, 297
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_rename_space_dimensions, 297
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_simplify_using_context_assign, 295
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_simplify_using_context_with_pointset, 295
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_size, 298
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_smash_space_dimensions, 296
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_status, 294
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_swap_space_dimensions, 294
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_upper_bound_assign_if_exact, 295
ppl_Pointset_Powerset_Octagonal_Shape_int64_t_topology, 294

294 280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_dec
297 283
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_dif
296 281
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_dro
296 283
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_dro
296 283
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_dro
296 283
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_dro
281 283
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_end
281 283
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_equ
281 281
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_exp
281 282
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_ext
283 283
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_fol
282 282
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_gen
282 282
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_gen
279 282
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_gen
282 282
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_gen
282 282
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_geo
283 280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_geo
283 280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_get
283 283
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_inc
283 283
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_int
282 281
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_
282 280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_
280 280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_
280 280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_
281 279
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_
282 280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_
280 279
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_Sha

283
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_map_dimensions,
282
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_max_dimension,
280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_max_space_dimension,
280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_min_dimension,
280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_min_space_dimension,
280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_OK,
281
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_omega_reduce,
280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_partition_fuel,
280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_refine_with_congruence,
281
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_refine_with_congruences,
281
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_refine_with_constraint,
281
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_refine_with_constraints,
281
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_relation_with_congruence,
279
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_relation_with_constraint,
279
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_relation_with_generator,
279
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_remove_higher_space_dimensions,
282
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_remove_space_dimensions,
282
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_simplify_using_context_assign,
281
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_size,
283
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_space_dimension,
279
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_strictly_contains,
280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_swap,
279
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_time_elapse_assign,
281
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_topological_closure_assign,
280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_total_memory_in_bytes,
283
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_unconstrain_space_dimension,
282
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_upper_bound_assign,
282
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_upper_bound_assign_if_exact,
280
ppl_Pointset_Powerset_Octagonal_Shape_int8_t_wrap_assign,
281
ppl_Pointset_Powerset_Octagonal_Shape_long_double,
462
ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_disjunct,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_disjuncts,
462
ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_space_dimensions_and_embed,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_space_dimensions_and_project,
465
ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_universe_disjunct,
464
ppl_Pointset_Powerset_Octagonal_Shape_long_double_affine_form_image,
464
ppl_Pointset_Powerset_Octagonal_Shape_long_double_affine_image,
461
ppl_Pointset_Powerset_Octagonal_Shape_long_double_affine_preimage,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_bounded_affine_image,
464
ppl_Pointset_Powerset_Octagonal_Shape_long_double_bounded_affine_preimage,
464
ppl_Pointset_Powerset_Octagonal_Shape_long_double_CC76_extrapolation_assign,
465
ppl_Pointset_Powerset_Octagonal_Shape_long_double_concatenate_assign,
465
ppl_Pointset_Powerset_Octagonal_Shape_long_double_contains,
464
ppl_Pointset_Powerset_Octagonal_Shape_long_double_drop_disjunct,
464
ppl_Pointset_Powerset_Octagonal_Shape_long_double_drop_disjuncts,
462
ppl_Pointset_Powerset_Octagonal_Shape_long_double_equals,
462
ppl_Pointset_Powerset_Octagonal_Shape_long_double_expand_space_dimension,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_fold_space_dimensions,
461
ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_image,
462
ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_preimage,
465
ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_preimage_lhs_rhs,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_preimage_with_congruence,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_preimage_with_constraint,

465
ppl_Pointset_Powerset_Octagonal_Shape
465
ppl_Pointset_Powerset_Octagonal_Shape
464
ppl_Pointset_Powerset_Octagonal_Shape
464
ppl_Pointset_Powerset_Octagonal_Shape
465
ppl_Pointset_Powerset_Octagonal_Shape
462
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465
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463
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461
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461
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465
ppl_Pointset_Powerset_Octagonal_Shape
464
ppl_Pointset_Powerset_Octagonal_Shape
462
ppl_Pointset_Powerset_Octagonal_Shape

462
ppl_Pointset_Powerset_Octagonal_Shape_long_double_drop_disjuncts,
462
ppl_Pointset_Powerset_Octagonal_Shape_long_double_drop_some_non_integer_points,
462
ppl_Pointset_Powerset_Octagonal_Shape_long_double_drop_some_non_integer_points_2,
462
ppl_Pointset_Powerset_Octagonal_Shape_long_double_end_iterator,
462
ppl_Pointset_Powerset_Octagonal_Shape_long_double_equals_Pointset_Powerset_Octagonal_Shape_long_double
462
ppl_Pointset_Powerset_Octagonal_Shape_long_double_expand_space_dimension,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_external_memory_in_bytes,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_fold_space_dimensions,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_image,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_image_lhs_rhs,
461
ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_preimage,
461
ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_preimage_lhs_rhs,
461
ppl_Pointset_Powerset_Octagonal_Shape_long_double_geometrically_covers_Pointset_Powerset_Octagonal_Shape_long_double
464
ppl_Pointset_Powerset_Octagonal_Shape_long_double_geometrically_equals_Pointset_Powerset_Octagonal_Shape_long_double
464
ppl_Pointset_Powerset_Octagonal_Shape_long_double_get_disjunct,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_increment_iterator,
465
ppl_Pointset_Powerset_Octagonal_Shape_long_double_intersection_assign,
461
ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_bounded,
462
ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_discrete,
461
ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_disjoint_from_Pointset_Powerset_Octagonal_Shape_long_double
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_empty,
461
ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_topologically_closed,
465
ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_universe,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_iterator_equals_iterator,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_max_space_dimension,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_maximize,
463
ppl_Pointset_Powerset_Octagonal_Shape_long_double_maximize_with_point,
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_

ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_e 300 302
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_e 300 303
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_e 300 300
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_e 300 302
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_e 303 302
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 302 302
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_c 302 302
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_c 299 302
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_c 301 302
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_c 301 302
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_c 302 300
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_c 303 300
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_c 303 303
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 303 303
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 301 301
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 302 299
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 299 299
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 300 300
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 301 299
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 301 299
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 299 299
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 300 303
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 303 302
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 301 300
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 303 300
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 303 300
ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_r 302 300
ppl_Pointset_Powerset_Octagonal_Shape_mpq2_class_C

300 305
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a
299 308
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a
299 307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a
301 307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a
301 304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a
301 306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a
301 306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_a
299 307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b
299 308
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b
299 308
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b
302 308
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b
302 306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b
301 306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b
302 304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b
299 304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_b
300 306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c
299 306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c
301 304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c
299 305
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c
302 308
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c
301 306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c
301 308
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c
301 308
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_c
301 307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_d ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_d
305 307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_e ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_e
305 308
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_e ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_e
305 305
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_e ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_e

307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_external_memory_in_bytes, 307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_fold_space_dimensions, 307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_generalized_affine_image, 307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_generalized_affine_image_lhs_rhs, 307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_generalized_affine_preimage, 307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_generalized_affine_preimage_lhs_rhs, 307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_geometrically_covers_Pointset_Powerset_Octagonal_Shape_mpz_class, 305
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_geometrically_equals_Pointset_Powerset_Octagonal_Shape_mpz_class, 305
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_get_disjunct, 308
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_increment_iterator, 308
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_intersection_assign, 306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_bounded, 304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_discrete, 304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_disjoint_from_Pointset_Powerset_Octagonal_Shape_mpz_class, 305
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_empty, 304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_topologically_closed, 304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_universe, 304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_iterator_equals_iterator, 308
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_map_space_dimensions, 307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_maximize, 305
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_maximize_with_point, 305
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_minimize, 305
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_minimize_with_point, 305
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_OK, 305
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_omega_reduce, 304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_pairwise_reduce, 304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_refine_with_congruence,

306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_i
306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_
305
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_
306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_
304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_
304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_
304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_
307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_
307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_s
306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_s
307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_s
304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_s
305
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_s
304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_
306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_t
304
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_t
307
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_u
306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_u
306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_u
306
ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_u
306
ppl_Pointset_Powerset_Rational_Box_add_congruence
242
ppl_Pointset_Powerset_Rational_Box_add_congruence
242
ppl_Pointset_Powerset_Rational_Box_add_constraint
242
ppl_Pointset_Powerset_Rational_Box_add_constraint
242
ppl_Pointset_Powerset_Rational_Box_add_disjunct,
245
ppl_Pointset_Powerset_Rational_Box_add_space_dime
244
ppl_Pointset_Powerset_Rational_Box_add_space_dime

ppl_Pointset_Powerset_Rational_Box_affine_image, 244
ppl_Pointset_Powerset_Rational_Box_affine_preimage, 241
ppl_Pointset_Powerset_Rational_Box_append, 243
ppl_Pointset_Powerset_Rational_Box_ascii_dump, 243
ppl_Pointset_Powerset_Rational_Box_bounded_affine_image, 244
ppl_Pointset_Powerset_Rational_Box_bounded_affine_preimage, 244
ppl_Pointset_Powerset_Rational_Box_build_cylindrification, 243
ppl_Pointset_Powerset_Rational_Box_build_partition, 243
ppl_Pointset_Powerset_Rational_Box_concatenate_assign, 241
ppl_Pointset_Powerset_Rational_Box_contains, 241
ppl_Pointset_Powerset_Rational_Box_contains_integer_point, 241
ppl_Pointset_Powerset_Rational_Box_difference_assign, 242
ppl_Pointset_Powerset_Rational_Box_drop_some_dimensions, 245
ppl_Pointset_Powerset_Rational_Box_drop_some_non_dimensions, 245
ppl_Pointset_Powerset_Rational_Box_equals_Powerset_Rational_Box, 242
ppl_Pointset_Powerset_Rational_Box_expand_space_dimension, 244
ppl_Pointset_Powerset_Rational_Box_external_memory_in_bytes, 244
ppl_Pointset_Powerset_Rational_Box_fold_space_dimensions, 244
ppl_Pointset_Powerset_Rational_Box_generalized_affine_image, 244
ppl_Pointset_Powerset_Rational_Box_generalized_affine_preimage, 243
ppl_Pointset_Powerset_Rational_Box_geometrically_covers, 242
ppl_Pointset_Powerset_Rational_Box_geometrically_equals, 242
ppl_Pointset_Powerset_Rational_Box_get_disjunct, 245
ppl_Pointset_Powerset_Rational_Box_increment_iterator, 245
ppl_Pointset_Powerset_Rational_Box_intersection_assign, 243
ppl_Pointset_Powerset_Rational_Box_is_bounded, 241
ppl_Pointset_Powerset_Rational_Box_is_discrete, 241
ppl_Pointset_Powerset_Rational_Box_is_disjoint_from_Powerset_Rational_Box, 242
ppl_Pointset_Powerset_Rational_Box_is_empty, 241
ppl_Pointset_Powerset_Rational_Box_is_topologically_closed, 241
ppl_Pointset_Powerset_Rational_Box_is_universe, 241
ppl_Pointset_Powerset_Rational_Box_iterator_equals_iterator, 245
ppl_Pointset_Powerset_Rational_Box_map_space_dimensions, 244
ppl_Pointset_Powerset_Rational_Box_maximize, 241
ppl_Pointset_Powerset_Rational_Box_maximize_with_reduction, 242
ppl_Pointset_Powerset_Rational_Box_minimize, 242
ppl_Pointset_Powerset_Rational_Box_minimize_with_reduction, 242
ppl_Pointset_Powerset_Rational_Box_OK, 242
ppl_Pointset_Powerset_Rational_Box_omega_reduce, 241
ppl_Pointset_Powerset_Rational_Box_pairwise_reduce, 241
ppl_Pointset_Powerset_Rational_Box_refine_with_constraint, 242
ppl_Pointset_Powerset_Rational_Box_refine_with_congruence, 243
ppl_Pointset_Powerset_Rational_Box_refine_with_congruences, 242
ppl_Pointset_Powerset_Rational_Box_refine_with_constraint, 243
ppl_Pointset_Powerset_Rational_Box_relation_with_constraint, 241
ppl_Pointset_Powerset_Rational_Box_relation_with_congruence, 241

ppl_Pointset_Powerset_Rational_Box_repl_Pointset_Powerset_Uint16_Box_bounded_affine_ 241 231
ppl_Pointset_Powerset_Rational_Box_remove_higher_space_dimensions_Uint16_Box_bounded_affine_ 241 230
ppl_Pointset_Powerset_Rational_Box_remove_space_dimensions_Uint16_Box_bounds_from_abo 244 230
ppl_Pointset_Powerset_Rational_Box_simplify_using_context_assign_Uint16_Box_bounds_from_belo 244 228
ppl_Pointset_Powerset_Rational_Box_spa_Pointset_Powerset_Uint16_Box_concatenate_assi 243 228
ppl_Pointset_Powerset_Rational_Box_spa_Pointset_Powerset_Uint16_Box_constrains, 244 229
ppl_Pointset_Powerset_Rational_Box_spa_Pointset_Powerset_Uint16_Box_constrains, 241 230
ppl_Pointset_Powerset_Rational_Box_spa_Pointset_Powerset_Uint16_Box_contains_Pointse 242 228
ppl_Pointset_Powerset_Rational_Box_spa_Pointset_Powerset_Uint16_Box_contains_Pointse 241 228
ppl_Pointset_Powerset_Rational_Box_tra_Pointset_Powerset_Uint16_Box_decrement_iterat 243 231
ppl_Pointset_Powerset_Rational_Box_tra_Pointset_Powerset_Uint16_Box_difference_assig 241 229
ppl_Pointset_Powerset_Rational_Box_tra_Pointset_Powerset_Uint16_Box_drop_disjunct, 244 231
ppl_Pointset_Powerset_Rational_Box_upp_Pointset_Powerset_Uint16_Box_drop_disjuncts, 243 231
ppl_Pointset_Powerset_Rational_Box_upp_Pointset_Powerset_Uint16_Box_drop_some_non_i 243 231
ppl_Pointset_Powerset_Rational_Box_upp_Pointset_Powerset_Uint16_Box_drop_some_non_i 243 231
ppl_Pointset_Powerset_Rational_Box_upp_Pointset_Powerset_Uint16_Box_end_iterator, 243 231
ppl_Pointset_Powerset_Uint16_Box_add_Pointset_Powerset_Uint16_Box_equals_Pointset 229 229
ppl_Pointset_Powerset_Uint16_Box_add_Pointset_Powerset_Uint16_Box_expand_space_di 229 231
ppl_Pointset_Powerset_Uint16_Box_add_Pointset_Powerset_Uint16_Box_external_memory 229 231
ppl_Pointset_Powerset_Uint16_Box_add_Pointset_Powerset_Uint16_Box_fold_space_dime 229 231
ppl_Pointset_Powerset_Uint16_Box_add_Pointset_Powerset_Uint16_Box_generalized_affi 231 230
ppl_Pointset_Powerset_Uint16_Box_add_Pointset_Powerset_Uint16_Box_generalized_affi 230 230
ppl_Pointset_Powerset_Uint16_Box_add_Pointset_Powerset_Uint16_Box_generalized_affi 230 230
ppl_Pointset_Powerset_Uint16_Box_affi_Pointset_Powerset_Uint16_Box_generalized_affi 228 230
ppl_Pointset_Powerset_Uint16_Box_affi_Pointset_Powerset_Uint16_Box_geometrically_co 230 229
ppl_Pointset_Powerset_Uint16_Box_affi_Pointset_Powerset_Uint16_Box_geometrically_eq 230 229
ppl_Pointset_Powerset_Uint16_Box_asci_Pointset_Powerset_Uint16_Box_get_disjunct, 231 231
ppl_Pointset_Powerset_Uint16_Box_begi_Pointset_Powerset_Uint16_Box_increment_iterat

231
ppl_Pointset_Powerset_Uint16_Box_intersection_assign,
229
ppl_Pointset_Powerset_Uint16_Box_is_bounded,
228
ppl_Pointset_Powerset_Uint16_Box_is_discrete,
228
ppl_Pointset_Powerset_Uint16_Box_is_disjoint_from_Pointset_Powerset_Uint16_Box,
229
ppl_Pointset_Powerset_Uint16_Box_is_empty,
228
ppl_Pointset_Powerset_Uint16_Box_is_topologically_closed,
228
ppl_Pointset_Powerset_Uint16_Box_is_universe,
228
ppl_Pointset_Powerset_Uint16_Box_iterator_equals_iterator,
231
ppl_Pointset_Powerset_Uint16_Box_map_space_dimensions,
231
ppl_Pointset_Powerset_Uint16_Box_maximize,
228
ppl_Pointset_Powerset_Uint16_Box_maximize_with_point,
228
ppl_Pointset_Powerset_Uint16_Box_minimize,
228
ppl_Pointset_Powerset_Uint16_Box_minimize_with_point,
228
ppl_Pointset_Powerset_Uint16_Box_OK,
229
ppl_Pointset_Powerset_Uint16_Box_omega_reduce,
228
ppl_Pointset_Powerset_Uint16_Box_pairwise_reduce,
228
ppl_Pointset_Powerset_Uint16_Box_refine_with_congruence,
229
ppl_Pointset_Powerset_Uint16_Box_refine_with_congruences,
229
ppl_Pointset_Powerset_Uint16_Box_refine_with_constraint,
229
ppl_Pointset_Powerset_Uint16_Box_refine_with_constraints,
229
ppl_Pointset_Powerset_Uint16_Box_relation_with_congruence,
228
ppl_Pointset_Powerset_Uint16_Box_relation_with_constraint,
228
ppl_Pointset_Powerset_Uint16_Box_relation_with_generator,
228
ppl_Pointset_Powerset_Uint16_Box_remove_higher_space_dimensions,
230
ppl_Pointset_Powerset_Uint16_Box_remove_space_dimensions,
230
ppl_Pointset_Powerset_Uint16_Box_simplify_using_context_assign,
230
ppl_Pointset_Powerset_Uint16_Box_size,
231
ppl_Pointset_Powerset_Uint16_Box_space_dimension,
227
ppl_Pointset_Powerset_Uint16_Box_strictly_contains,
229
ppl_Pointset_Powerset_Uint16_Box_swap,
227
ppl_Pointset_Powerset_Uint16_Box_time_elapse_assign,
229
ppl_Pointset_Powerset_Uint16_Box_topological_closure_assign,
228
ppl_Pointset_Powerset_Uint16_Box_total_memory_in_bytes,
231
ppl_Pointset_Powerset_Uint16_Box_unconstrain_space_dimension,
230
ppl_Pointset_Powerset_Uint16_Box_unconstrain_space_dimensions,
230
ppl_Pointset_Powerset_Uint16_Box_upper_bound_assign,
229
ppl_Pointset_Powerset_Uint16_Box_upper_bound_assign_if_exact,
230
ppl_Pointset_Powerset_Uint32_Box_add_congruence,
233
ppl_Pointset_Powerset_Uint32_Box_add_congruences,
233
ppl_Pointset_Powerset_Uint32_Box_add_constraint,
233
ppl_Pointset_Powerset_Uint32_Box_add_constraints,
233
ppl_Pointset_Powerset_Uint32_Box_add_disjunct,
236
ppl_Pointset_Powerset_Uint32_Box_add_space_dimensions_and_embed,
235
ppl_Pointset_Powerset_Uint32_Box_add_space_dimensions_and_project,
235
ppl_Pointset_Powerset_Uint32_Box_affine_dimension,
232
ppl_Pointset_Powerset_Uint32_Box_affine_image,
234
ppl_Pointset_Powerset_Uint32_Box_affine_preimage,
234
ppl_Pointset_Powerset_Uint32_Box_ascii_dump,
235
ppl_Pointset_Powerset_Uint32_Box_begin_iterator,
235
ppl_Pointset_Powerset_Uint32_Box_bounded_affine_image,
234
ppl_Pointset_Powerset_Uint32_Box_bounded_affine_preimage,
234
ppl_Pointset_Powerset_Uint32_Box_bounds_from_above,
233
ppl_Pointset_Powerset_Uint32_Box_bounds_from_below,
233
ppl_Pointset_Powerset_Uint32_Box_concatenate_assign,

ppl_Pointset_Powerset_Uint32_Box_constrain, 234
ppl_Pointset_Powerset_Uint32_Box_contains, 234
ppl_Pointset_Powerset_Uint32_Box_contains_integer_point, 232
ppl_Pointset_Powerset_Uint32_Box_decrement_iterator, 233
ppl_Pointset_Powerset_Uint32_Box_difference_assign, 236
ppl_Pointset_Powerset_Uint32_Box_drop_disjuncts, 234
ppl_Pointset_Powerset_Uint32_Box_drop_disjuncts, 236
ppl_Pointset_Powerset_Uint32_Box_drop_some_non_integer_points, 236
ppl_Pointset_Powerset_Uint32_Box_drop_some_non_integer_points, 235
ppl_Pointset_Powerset_Uint32_Box_end_iterator, 235
ppl_Pointset_Powerset_Uint32_Box_equals, 235
ppl_Pointset_Powerset_Uint32_Box_expand_space_dimension, 233
ppl_Pointset_Powerset_Uint32_Box_external_memory, 235
ppl_Pointset_Powerset_Uint32_Box_fold_space_dimensions, 235
ppl_Pointset_Powerset_Uint32_Box_generalized_affine_image, 235
ppl_Pointset_Powerset_Uint32_Box_generalized_affine_image, 234
ppl_Pointset_Powerset_Uint32_Box_generalized_affine_preimage, 235
ppl_Pointset_Powerset_Uint32_Box_generalized_affine_preimage, 235
ppl_Pointset_Powerset_Uint32_Box_generalized_affine_preimage, 235
ppl_Pointset_Powerset_Uint32_Box_geometrically_covers, 233
ppl_Pointset_Powerset_Uint32_Box_geometrically_equals, 233
ppl_Pointset_Powerset_Uint32_Box_get_disjunct, 236
ppl_Pointset_Powerset_Uint32_Box_increment_iterator, 236
ppl_Pointset_Powerset_Uint32_Box_intersection_assign, 234
ppl_Pointset_Powerset_Uint32_Box_is_bounded, 232
ppl_Pointset_Powerset_Uint32_Box_is_disjoint_from, 232
ppl_Pointset_Powerset_Uint32_Box_is_disjoint_from, 233
ppl_Pointset_Powerset_Uint32_Box_is_empty, 232
ppl_Pointset_Powerset_Uint32_Box_is_topologically, 232
ppl_Pointset_Powerset_Uint32_Box_is_universe, 232
ppl_Pointset_Powerset_Uint32_Box_iterator_equals, 236
ppl_Pointset_Powerset_Uint32_Box_map_space_dimens, 235
ppl_Pointset_Powerset_Uint32_Box_maximize, 233
ppl_Pointset_Powerset_Uint32_Box_maximize_with_po, 233
ppl_Pointset_Powerset_Uint32_Box_minimize, 233
ppl_Pointset_Powerset_Uint32_Box_minimize_with_po, 233
ppl_Pointset_Powerset_Uint32_Box_OK, 233
ppl_Pointset_Powerset_Uint32_Box_omega_reduce, 232
ppl_Pointset_Powerset_Uint32_Box_pairwise_reduce, 232
ppl_Pointset_Powerset_Uint32_Box_refine_with_conc, 233
ppl_Pointset_Powerset_Uint32_Box_refine_with_conc, 234
ppl_Pointset_Powerset_Uint32_Box_refine_with_cons, 233
ppl_Pointset_Powerset_Uint32_Box_refine_with_cons, 234
ppl_Pointset_Powerset_Uint32_Box_relation_with_co, 232
ppl_Pointset_Powerset_Uint32_Box_relation_with_co, 232
ppl_Pointset_Powerset_Uint32_Box_relation_with_ge, 232
ppl_Pointset_Powerset_Uint32_Box_remove_disjunct, 235
ppl_Pointset_Powerset_Uint32_Box_remove_space_dim, 235
ppl_Pointset_Powerset_Uint32_Box_simplify_using_c, 234
ppl_Pointset_Powerset_Uint32_Box_size, 235
ppl_Pointset_Powerset_Uint32_Box_space_dimension, 232
ppl_Pointset_Powerset_Uint32_Box_strictly_contain, 233
ppl_Pointset_Powerset_Uint32_Box_swap, 232
ppl_Pointset_Powerset_Uint32_Box_upper_bound_assi, 234
ppl_Pointset_Powerset_Uint32_Box_topological_clos,

ppl_Pointset_Powerset_Uint32_Box_total_memory_in_bytes, 232
ppl_Pointset_Powerset_Uint32_Box_uncompress, 235
ppl_Pointset_Powerset_Uint32_Box_upper_bound_assign, 234
ppl_Pointset_Powerset_Uint32_Box_upper_bound_assign_if_exact, 234
ppl_Pointset_Powerset_Uint64_Box_add_constraint, 238
ppl_Pointset_Powerset_Uint64_Box_add_constraints, 238
ppl_Pointset_Powerset_Uint64_Box_add_disjunct, 238
ppl_Pointset_Powerset_Uint64_Box_add_disjunct, 240
ppl_Pointset_Powerset_Uint64_Box_add_space_dimensions_and_embed, 239
ppl_Pointset_Powerset_Uint64_Box_add_space_dimensions_and_project, 239
ppl_Pointset_Powerset_Uint64_Box_affine_dimension, 239
ppl_Pointset_Powerset_Uint64_Box_affine_image, 236
ppl_Pointset_Powerset_Uint64_Box_affine_preimage, 239
ppl_Pointset_Powerset_Uint64_Box_ascii_dump, 239
ppl_Pointset_Powerset_Uint64_Box_begin_iterator, 240
ppl_Pointset_Powerset_Uint64_Box_bounded_affine_image, 240
ppl_Pointset_Powerset_Uint64_Box_bounded_affine_preimage, 239
ppl_Pointset_Powerset_Uint64_Box_bounds_from_above, 239
ppl_Pointset_Powerset_Uint64_Box_bounds_from_below, 237
ppl_Pointset_Powerset_Uint64_Box_concatenate_assign, 237
ppl_Pointset_Powerset_Uint64_Box_constrains, 238
ppl_Pointset_Powerset_Uint64_Box_contains_integer_point, 238
ppl_Pointset_Powerset_Uint64_Box_contains_Pointset_Powerset_Uint64_Box, 237
ppl_Pointset_Powerset_Uint64_Box_decrement_iterator, 237
ppl_Pointset_Powerset_Uint64_Box_difference_assign, 240
ppl_Pointset_Powerset_Uint64_Box_drop_disjunct, 238
ppl_Pointset_Powerset_Uint64_Box_drop_disjuncts, 240
ppl_Pointset_Powerset_Uint64_Box_drop_some_non_integer_dimensions, 240
ppl_Pointset_Powerset_Uint64_Box_drop_some_non_integer_dimensions, 239
ppl_Pointset_Powerset_Uint64_Box_end_iterator, 240
ppl_Pointset_Powerset_Uint64_Box_equals_Pointset_Powerset_Uint64_Box, 238
ppl_Pointset_Powerset_Uint64_Box_expand_space_dimension, 239
ppl_Pointset_Powerset_Uint64_Box_external_memory_in_bytes, 240
ppl_Pointset_Powerset_Uint64_Box_fold_space_dimensions, 239
ppl_Pointset_Powerset_Uint64_Box_generalized_affine_image, 239
ppl_Pointset_Powerset_Uint64_Box_generalized_affine_image_lhs_rhs, 239
ppl_Pointset_Powerset_Uint64_Box_generalized_affine_preimage, 239
ppl_Pointset_Powerset_Uint64_Box_generalized_affine_preimage_lhs_rhs, 239
ppl_Pointset_Powerset_Uint64_Box_geometrically_covers_Pointset_Powerset_Uint64_Box, 237
ppl_Pointset_Powerset_Uint64_Box_geometrically_equals_Pointset_Powerset_Uint64_Box, 238
ppl_Pointset_Powerset_Uint64_Box_get_disjunct, 240
ppl_Pointset_Powerset_Uint64_Box_increment_iterator, 240
ppl_Pointset_Powerset_Uint64_Box_intersection_assign, 238
ppl_Pointset_Powerset_Uint64_Box_is_bounded, 237
ppl_Pointset_Powerset_Uint64_Box_is_discrete, 237
ppl_Pointset_Powerset_Uint64_Box_is_disjoint_from_Pointset_Powerset_Uint64_Box, 237
ppl_Pointset_Powerset_Uint64_Box_is_empty, 237
ppl_Pointset_Powerset_Uint64_Box_is_topologically_closed, 237
ppl_Pointset_Powerset_Uint64_Box_is_universe, 237
ppl_Pointset_Powerset_Uint64_Box_iterator_equals_iterator, 240
ppl_Pointset_Powerset_Uint64_Box_map_space_dimensions, 239
ppl_Pointset_Powerset_Uint64_Box_maximize,

237
ppl_Pointset_Powerset_Uint64_Box_maximize_with_point,
237
ppl_Pointset_Powerset_Uint64_Box_minimize,
237
ppl_Pointset_Powerset_Uint64_Box_minimize_with_point,
237
ppl_Pointset_Powerset_Uint64_Box_OK,
238
ppl_Pointset_Powerset_Uint64_Box_omega_reduce,
237
ppl_Pointset_Powerset_Uint64_Box_pairwise_reduce,
237
ppl_Pointset_Powerset_Uint64_Box_refine_with_congruence,
238
ppl_Pointset_Powerset_Uint64_Box_refine_with_congruences,
238
ppl_Pointset_Powerset_Uint64_Box_refine_with_constraint,
238
ppl_Pointset_Powerset_Uint64_Box_refine_with_constraints,
238
ppl_Pointset_Powerset_Uint64_Box_relation_with_congruence,
237
ppl_Pointset_Powerset_Uint64_Box_relation_with_constraint,
236
ppl_Pointset_Powerset_Uint64_Box_relation_with_generator,
236
ppl_Pointset_Powerset_Uint64_Box_remove_higher_space_dimensions,
239
ppl_Pointset_Powerset_Uint64_Box_remove_space_dimensions,
239
ppl_Pointset_Powerset_Uint64_Box_simplify_using_context_assign,
238
ppl_Pointset_Powerset_Uint64_Box_size,
240
ppl_Pointset_Powerset_Uint64_Box_space_dimension,
236
ppl_Pointset_Powerset_Uint64_Box_strictly_contains_Powerset_Box,
237
ppl_Pointset_Powerset_Uint64_Box_swap,
236
ppl_Pointset_Powerset_Uint64_Box_time_elapse_assign,
238
ppl_Pointset_Powerset_Uint64_Box_topological_closure_assign,
237
ppl_Pointset_Powerset_Uint64_Box_total_memory_in_bytes,
240
ppl_Pointset_Powerset_Uint64_Box_unconstrain_space_dimension,
238
ppl_Pointset_Powerset_Uint64_Box_unconstrain_space_dimensions,
239
ppl_Pointset_Powerset_Uint64_Box_upper_bound_assign,
238
ppl_Pointset_Powerset_Uint64_Box_upper_bound_assign_if_exact,
238
ppl_Pointset_Powerset_Uint8_Box_add_congruence,
225
ppl_Pointset_Powerset_Uint8_Box_add_congruences,
225
ppl_Pointset_Powerset_Uint8_Box_add_constraint,
224
ppl_Pointset_Powerset_Uint8_Box_add_constraints,
225
ppl_Pointset_Powerset_Uint8_Box_add_disjunct,
227
ppl_Pointset_Powerset_Uint8_Box_add_space_dimensions_and_embed,
226
ppl_Pointset_Powerset_Uint8_Box_add_space_dimensions_and_project,
226
ppl_Pointset_Powerset_Uint8_Box_affine_dimension,
223
ppl_Pointset_Powerset_Uint8_Box_affine_image,
225
ppl_Pointset_Powerset_Uint8_Box_affine_preimage,
225
ppl_Pointset_Powerset_Uint8_Box_ascii_dump,
226
ppl_Pointset_Powerset_Uint8_Box_begin_iterator,
227
ppl_Pointset_Powerset_Uint8_Box_bounded_affine_image,
226
ppl_Pointset_Powerset_Uint8_Box_bounded_affine_preimage,
226
ppl_Pointset_Powerset_Uint8_Box_bounds_from_above,
224
ppl_Pointset_Powerset_Uint8_Box_bounds_from_below,
224
ppl_Pointset_Powerset_Uint8_Box_concatenate_assign,
225
ppl_Pointset_Powerset_Uint8_Box_constrains,
225
ppl_Pointset_Powerset_Uint8_Box_contains_Integer_Point,
223
ppl_Pointset_Powerset_Uint8_Box_contains_Pointset_Powerset_Box,
224
ppl_Pointset_Powerset_Uint8_Box_decrement_iterator,
227
ppl_Pointset_Powerset_Uint8_Box_difference_assign,
225
ppl_Pointset_Powerset_Uint8_Box_drop_disjunct,
227
ppl_Pointset_Powerset_Uint8_Box_drop_disjuncts,
227
ppl_Pointset_Powerset_Uint8_Box_drop_some_non_integer_points,
226
ppl_Pointset_Powerset_Uint8_Box_drop_some_non_integer_points_2,
226
ppl_Pointset_Powerset_Uint8_Box_end_iterator,

227
ppl_Pointset_Powerset_Uint8_Box_equals,
224
ppl_Pointset_Powerset_Uint8_Box_expand_space_dimension,
226
ppl_Pointset_Powerset_Uint8_Box_external_memory_in_bytes,
226
ppl_Pointset_Powerset_Uint8_Box_fold_space_dimensions,
226
ppl_Pointset_Powerset_Uint8_Box_generalized_affine_image,
226
ppl_Pointset_Powerset_Uint8_Box_generalized_affine_image_lhs_rhs,
226
ppl_Pointset_Powerset_Uint8_Box_generalized_affine_preimage,
226
ppl_Pointset_Powerset_Uint8_Box_generalized_affine_preimage_lhs_rhs,
226
ppl_Pointset_Powerset_Uint8_Box_geometrically_covers,
224
ppl_Pointset_Powerset_Uint8_Box_geometrically_equals,
224
ppl_Pointset_Powerset_Uint8_Box_get_disjunct,
227
ppl_Pointset_Powerset_Uint8_Box_increment,
227
ppl_Pointset_Powerset_Uint8_Box_intersection_assign,
225
ppl_Pointset_Powerset_Uint8_Box_is_bounded,
223
ppl_Pointset_Powerset_Uint8_Box_is_disjoint_from,
224
ppl_Pointset_Powerset_Uint8_Box_is_disjunct_finer_than,
224
ppl_Pointset_Powerset_Uint8_Box_is_empty,
223
ppl_Pointset_Powerset_Uint8_Box_is_topologically_closed,
224
ppl_Pointset_Powerset_Uint8_Box_is_universe,
223
ppl_Pointset_Powerset_Uint8_Box_iterator_equals_iterator,
227
ppl_Pointset_Powerset_Uint8_Box_map_space_dimensions,
226
ppl_Pointset_Powerset_Uint8_Box_maximize,
224
ppl_Pointset_Powerset_Uint8_Box_maximize_with_point,
224
ppl_Pointset_Powerset_Uint8_Box_minimize,
224
ppl_Pointset_Powerset_Uint8_Box_minimize_with_point,
224
ppl_Pointset_Powerset_Uint8_Box_OK,
224
ppl_Pointset_Powerset_Uint8_Box_omega_reduce,
224
ppl_Pointset_Powerset_Uint8_Box_pairwise_reduce,
224
ppl_Pointset_Powerset_Uint8_Box_refine_with_congruence,
225
ppl_Pointset_Powerset_Uint8_Box_refine_with_congruences,
225
ppl_Pointset_Powerset_Uint8_Box_refine_with_constraint,
225
ppl_Pointset_Powerset_Uint8_Box_refine_with_constraints,
225
ppl_Pointset_Powerset_Uint8_Box_relation_with_congruence,
223
ppl_Pointset_Powerset_Uint8_Box_relation_with_constraint,
223
ppl_Pointset_Powerset_Uint8_Box_relation_with_generator,
223
ppl_Pointset_Powerset_Uint8_Box_remove_higher_space_dimensions,
226
ppl_Pointset_Powerset_Uint8_Box_remove_space_dimensions,
226
ppl_Pointset_Powerset_Uint8_Box_simplify_using_context_assign,
225
ppl_Pointset_Powerset_Uint8_Box_size,
226
ppl_Pointset_Powerset_Uint8_Box_space_dimension,
223
ppl_Pointset_Powerset_Uint8_Box_strictly_contains,
224
ppl_Pointset_Powerset_Uint8_Box_swap,
223
ppl_Pointset_Powerset_Uint8_Box_time_elapse_assign,
225
ppl_Pointset_Powerset_Uint8_Box_topological_closure_assign,
224
ppl_Pointset_Powerset_Uint8_Box_total_memory_in_bytes,
226
ppl_Pointset_Powerset_Uint8_Box_unconstrain_space_dimension,
225
ppl_Pointset_Powerset_Uint8_Box_unconstrain_space_dimensions,
225
ppl_Pointset_Powerset_Uint8_Box_upper_bound_assign,
225
ppl_Pointset_Powerset_Uint8_Box_upper_bound_assign_if_exact,
225
ppl_Pointset_Powerset_Z_Box_add_congruence,
247
ppl_Pointset_Powerset_Z_Box_add_congruences,
247
ppl_Pointset_Powerset_Z_Box_add_constraint,
247
ppl_Pointset_Powerset_Z_Box_add_constraints,
247
ppl_Pointset_Powerset_Z_Box_add_disjunct,

ppl_Pointset_Powerset_Z_Box_add_space_dimensions_and_embed, 249
ppl_Pointset_Powerset_Z_Box_add_space_dimensions_and_project, 248
ppl_Pointset_Powerset_Z_Box_affine_dimension, 248
ppl_Pointset_Powerset_Z_Box_affine_image, 245
ppl_Pointset_Powerset_Z_Box_affine_preimage, 248
ppl_Pointset_Powerset_Z_Box_ascii_dump, 248
ppl_Pointset_Powerset_Z_Box_begin_iterator, 248
ppl_Pointset_Powerset_Z_Box_bounded_affine_image, 249
ppl_Pointset_Powerset_Z_Box_bounded_affine_preimage, 248
ppl_Pointset_Powerset_Z_Box_bounds_from_above, 248
ppl_Pointset_Powerset_Z_Box_bounds_from_below, 246
ppl_Pointset_Powerset_Z_Box_concatenate_assign, 246
ppl_Pointset_Powerset_Z_Box_constrains, 247
ppl_Pointset_Powerset_Z_Box_contains_integer_point, 247
ppl_Pointset_Powerset_Z_Box_contains_Powerset_Z_Box, 246
ppl_Pointset_Powerset_Z_Box_decrement_iterator, 246
ppl_Pointset_Powerset_Z_Box_difference_assign, 249
ppl_Pointset_Powerset_Z_Box_drop_disjunct, 247
ppl_Pointset_Powerset_Z_Box_drop_disjuncts, 249
ppl_Pointset_Powerset_Z_Box_drop_some_non_integer_points, 249
ppl_Pointset_Powerset_Z_Box_drop_some_non_integer_points_2, 248
ppl_Pointset_Powerset_Z_Box_end_iterator, 248
ppl_Pointset_Powerset_Z_Box_equals_Pointset_Powerset_Z_Box, 249
ppl_Pointset_Powerset_Z_Box_expand_space_dimension, 247
ppl_Pointset_Powerset_Z_Box_external_memory_in_bytes, 248
ppl_Pointset_Powerset_Z_Box_fold_space_dimensions, 249
ppl_Pointset_Powerset_Z_Box_generalized_affine_image, 248
ppl_Pointset_Powerset_Z_Box_generalized_affine_image_lhs_rhs, 248
ppl_Pointset_Powerset_Z_Box_generalized_affine_preimage, 248
ppl_Pointset_Powerset_Z_Box_generalized_affine_preimage_lhs_rhs, 248
ppl_Pointset_Powerset_Z_Box_geometrically_covers, 246
ppl_Pointset_Powerset_Z_Box_geometrically_equals, 246
ppl_Pointset_Powerset_Z_Box_get_disjunct, 249
ppl_Pointset_Powerset_Z_Box_increment_iterator, 249
ppl_Pointset_Powerset_Z_Box_intersection_assign, 247
ppl_Pointset_Powerset_Z_Box_is_bounded, 246
ppl_Pointset_Powerset_Z_Box_is_discrete, 246
ppl_Pointset_Powerset_Z_Box_is_disjoint_from_Poin
ppl_Pointset_Powerset_Z_Box_is_empty, 246
ppl_Pointset_Powerset_Z_Box_is_topologically_clos
ppl_Pointset_Powerset_Z_Box_is_universe, 246
ppl_Pointset_Powerset_Z_Box_iterator_equals_itera
ppl_Pointset_Powerset_Z_Box_map_space_dimensions, 249
ppl_Pointset_Powerset_Z_Box_maximize, 248
ppl_Pointset_Powerset_Z_Box_maximize_with_point, 246
ppl_Pointset_Powerset_Z_Box_minimize, 246
ppl_Pointset_Powerset_Z_Box_minimize_with_point, 246
ppl_Pointset_Powerset_Z_Box_OK, 247
ppl_Pointset_Powerset_Z_Box_omega_reduce, 246
ppl_Pointset_Powerset_Z_Box_pairwise_reduce, 246
ppl_Pointset_Powerset_Z_Box_refine_with_congruenc
ppl_Pointset_Powerset_Z_Box_refine_with_congruenc
ppl_Pointset_Powerset_Z_Box_refine_with_constrain
ppl_Pointset_Powerset_Z_Box_refine_with_constrain

ppl_Pointset_Powerset_Z_Box_relation_with_congruence, 246
ppl_Pointset_Powerset_Z_Box_relation_with_constraint, 245
ppl_Pointset_Powerset_Z_Box_relation_with_generator, 245
ppl_Pointset_Powerset_Z_Box_remove_higher_space_dimensions, 248
ppl_Pointset_Powerset_Z_Box_remove_space_dimensions, 248
ppl_Pointset_Powerset_Z_Box_simplify_using_context_assign, 247
ppl_Pointset_Powerset_Z_Box_size, 249
ppl_Pointset_Powerset_Z_Box_space_dimension, 245
ppl_Pointset_Powerset_Z_Box_strictly_contains_Pointset_Powerset_Z_Box, 246
ppl_Pointset_Powerset_Z_Box_swap, 245
ppl_Pointset_Powerset_Z_Box_time_elapse_assign, 247
ppl_Pointset_Powerset_Z_Box_topological_closure_assign, 246
ppl_Pointset_Powerset_Z_Box_total_memory_in_bytes, 249
ppl_Pointset_Powerset_Z_Box_unconstrain_space_dimension, 247
ppl_Pointset_Powerset_Z_Box_unconstrain_space_dimensions, 247
ppl_Pointset_Powerset_Z_Box_upper_bound_assign, 247
ppl_Pointset_Powerset_Z_Box_upper_bound_assign_if_exact, 247
ppl_Polyhedron_add_congruence, 195
ppl_Polyhedron_add_congruences, 195
ppl_Polyhedron_add_constraint, 195
ppl_Polyhedron_add_constraints, 195
ppl_Polyhedron_add_generator, 195
ppl_Polyhedron_add_generators, 195
ppl_Polyhedron_add_space_dimensions_and_embed, 196
ppl_Polyhedron_add_space_dimensions_and_project, 197
ppl_Polyhedron_affine_dimension, 194
ppl_Polyhedron_affine_image, 196
ppl_Polyhedron_affine_preimage, 196
ppl_Polyhedron_ascii_dump, 197
ppl_Polyhedron_BHRZ03_widening_assign, 197
ppl_Polyhedron_BHRZ03_widening_assign_with_tokens, 197
ppl_Polyhedron_bounded_affine_image, 196
ppl_Polyhedron_bounded_affine_preimage, 196
ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign, 197
ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign_with_tokens, 197
ppl_Polyhedron_bounded_H79_extrapolation_assign, 198
ppl_Polyhedron_bounded_H79_extrapolation_assign_with_tokens, 197
ppl_Polyhedron_bounds_from_above, 195
ppl_Polyhedron_bounds_from_below, 195
ppl_Polyhedron_concatenate_assign, 196
ppl_Polyhedron_constrains, 196
ppl_Polyhedron_contains_integer_point, 195
ppl_Polyhedron_contains_Polyhedron, 195
ppl_Polyhedron_difference_assign, 196
ppl_Polyhedron_drop_some_non_integer_points, 197
ppl_Polyhedron_drop_some_non_integer_points_2, 197
ppl_Polyhedron_equals_Polyhedron, 195
ppl_Polyhedron_expand_space_dimension, 197
ppl_Polyhedron_external_memory_in_bytes, 197
ppl_Polyhedron_fold_space_dimensions, 197
ppl_Polyhedron_frequency, 195
ppl_Polyhedron_generalized_affine_image, 196
ppl_Polyhedron_generalized_affine_image_lhs_rhs, 196
ppl_Polyhedron_generalized_affine_preimage, 196
ppl_Polyhedron_generalized_affine_preimage_lhs_rhs, 196
ppl_Polyhedron_get_congruences, 194
ppl_Polyhedron_get_constraints, 194
ppl_Polyhedron_get_generators, 194
ppl_Polyhedron_get_minimized_congruences, 194
ppl_Polyhedron_get_minimized_constraints, 194
ppl_Polyhedron_get_minimized_generators, 194

ppl_Polyhedron_H79_widening_assign, 197
ppl_Polyhedron_H79_widening_assign_with_tokens, 197
ppl_Polyhedron_intersection_assign, 196
ppl_Polyhedron_is_bounded, 195
ppl_Polyhedron_is_discrete, 195
ppl_Polyhedron_is_disjoint_from_Polyhedron, 195
ppl_Polyhedron_is_empty, 195
ppl_Polyhedron_is_topologically_closed, 195
ppl_Polyhedron_is_universe, 195
ppl_Polyhedron_limited_BHRZ03_extrapolation_assign, 197
ppl_Polyhedron_limited_BHRZ03_extrapolation_assign_with_tokens, 197
ppl_Polyhedron_limited_H79_extrapolation_assign, 197
ppl_Polyhedron_limited_H79_extrapolation_assign_with_tokens, 197
ppl_Polyhedron_linear_partition, 198
ppl_Polyhedron_map_space_dimensions, 197
ppl_Polyhedron_maximize, 195
ppl_Polyhedron_maximize_with_point, 195
ppl_Polyhedron_minimize, 195
ppl_Polyhedron_minimize_with_point, 195
ppl_Polyhedron_OK, 195
ppl_Polyhedron_poly_difference_assign, 196
ppl_Polyhedron_poly_hull_assign, 196
ppl_Polyhedron_poly_hull_assign_if_exact, 196
ppl_Polyhedron_refine_with_congruence, 195
ppl_Polyhedron_refine_with_congruences, 196
ppl_Polyhedron_refine_with_constraint, 195
ppl_Polyhedron_refine_with_constraints, 195
ppl_Polyhedron_relation_with_congruence, 194
ppl_Polyhedron_relation_with_constraint, 194
ppl_Polyhedron_relation_with_generator, 194
ppl_Polyhedron_remove_higher_space_dimensions, 197
ppl_Polyhedron_remove_space_dimensions, 197
ppl_Polyhedron_simplify_using_context_assign, 196
ppl_Polyhedron_space_dimension, 194
ppl_Polyhedron_strictly_contains_Polyhedron, 195
ppl_Polyhedron_swap, 194
ppl_Polyhedron_time_elapse_assign, 196
ppl_Polyhedron_topological_closure_assign, 195
ppl_Polyhedron_total_memory_in_bytes, 197
ppl_Polyhedron_unconstrain_space_dimension, 196
ppl_Polyhedron_unconstrain_space_dimensions, 196
ppl_Polyhedron_upper_bound_assign, 196
ppl_Polyhedron_upper_bound_assign_if_exact, 196
ppl_Polyhedron_widening_assign, 197
ppl_Polyhedron_widening_assign_with_tokens, 197
ppl_Polyhedron_wrap_assign, 198
ppl_Rational_Box_add_congruence, 86
ppl_Rational_Box_add_congruences, 86
ppl_Rational_Box_add_constraint, 86
ppl_Rational_Box_add_constraints, 86
ppl_Rational_Box_add_space_dimensions_and_embed, 87
ppl_Rational_Box_add_space_dimensions_and_project 87
ppl_Rational_Box_affine_dimension, 85
ppl_Rational_Box_affine_image, 87
ppl_Rational_Box_affine_preimage, 87
ppl_Rational_Box_ascii_dump, 88
ppl_Rational_Box_bounded_affine_image, 87
ppl_Rational_Box_bounded_affine_preimage, 87
ppl_Rational_Box_bounds_from_above, 85
ppl_Rational_Box_bounds_from_below, 85
ppl_Rational_Box_CC76_widening_assign, 88
ppl_Rational_Box_CC76_widening_assign_with_tokens 88
ppl_Rational_Box_concatenate_assign, 86
ppl_Rational_Box_constrains, 86

ppl_Rational_Box_contains_integer_point, 85
ppl_Rational_Box_contains_Rational_Box, 86
ppl_Rational_Box_difference_assign, 86
ppl_Rational_Box_drop_some_non_integer_points, 87
ppl_Rational_Box_drop_some_non_integer_points_2, 87
ppl_Rational_Box_equals_Rational_Box, 86
ppl_Rational_Box_expand_space_dimension, 87
ppl_Rational_Box_external_memory_in_bytes, 88
ppl_Rational_Box_fold_space_dimensions, 87
ppl_Rational_Box_frequency, 86
ppl_Rational_Box_generalized_affine_image, 87
ppl_Rational_Box_generalized_affine_image_lhs_rhs, 87
ppl_Rational_Box_generalized_affine_preimage, 87
ppl_Rational_Box_generalized_affine_preimage_lhs_rhs, 87
ppl_Rational_Box_get_congruences, 85
ppl_Rational_Box_get_constraints, 85
ppl_Rational_Box_get_minimized_congruences, 85
ppl_Rational_Box_get_minimized_constraints, 85
ppl_Rational_Box_intersection_assign, 86
ppl_Rational_Box_is_bounded, 85
ppl_Rational_Box_is_discrete, 85
ppl_Rational_Box_is_disjoint_from_Rational_Box, 86
ppl_Rational_Box_is_empty, 85
ppl_Rational_Box_is_topologically_closed, 85
ppl_Rational_Box_is_universe, 85
ppl_Rational_Box_limited_CC76_extrapolation_assign, 88
ppl_Rational_Box_limited_CC76_extrapolation_assign_with_tokens, 88
ppl_Rational_Box_linear_partition, 88
ppl_Rational_Box_map_space_dimensions, 87
ppl_Rational_Box_maximize, 85
ppl_Rational_Box_maximize_with_point, 85
ppl_Rational_Box_minimize, 85
ppl_Rational_Box_minimize_with_point, 86
ppl_Rational_Box_OK, 86
ppl_Rational_Box_refine_with_congruence, 86
ppl_Rational_Box_refine_with_congruences, 86
ppl_Rational_Box_refine_with_constraint, 86
ppl_Rational_Box_refine_with_constraints, 86
ppl_Rational_Box_relation_with_congruence, 85
ppl_Rational_Box_relation_with_constraint, 85
ppl_Rational_Box_relation_with_generator, 85
ppl_Rational_Box_remove_higher_space_dimensions, 87
ppl_Rational_Box_remove_space_dimensions, 87
ppl_Rational_Box_simplify_using_context_assign, 86
ppl_Rational_Box_space_dimension, 85
ppl_Rational_Box_strictly_contains_Rational_Box, 86
ppl_Rational_Box_swap, 85
ppl_Rational_Box_time_elapse_assign, 86
ppl_Rational_Box_topological_closure_assign, 85
ppl_Rational_Box_total_memory_in_bytes, 88
ppl_Rational_Box_unconstrain_space_dimension, 86
ppl_Rational_Box_unconstrain_space_dimensions, 87
ppl_Rational_Box_upper_bound_assign, 86
ppl_Rational_Box_upper_bound_assign_if_exact, 86
ppl_Rational_Box_widening_assign, 88
ppl_Rational_Box_widening_assign_with_tokens, 88
ppl_Rational_Box_wrap_assign, 88
ppl_reset_deterministic_timeout, 22
ppl_reset_timeout, 22
ppl_restore_pre_PPL_rounding, 22
ppl_set_deterministic_timeout, 22
ppl_set_irrational_precision, 22
ppl_set_rounding_for_PPL, 22
ppl_set_timeout, 22

ppl_termination_test_MS_BD_Shape_double, 403
ppl_termination_test_MS_BD_Shape_double_2, 403
ppl_termination_test_MS_BD_Shape_float, 367
ppl_termination_test_MS_BD_Shape_float_2, 367
ppl_termination_test_MS_BD_Shape_int16_t, 104
ppl_termination_test_MS_BD_Shape_int16_t_2, 104
ppl_termination_test_MS_BD_Shape_int32_t, 112
ppl_termination_test_MS_BD_Shape_int32_t_2, 112
ppl_termination_test_MS_BD_Shape_int64_t, 120
ppl_termination_test_MS_BD_Shape_int64_t_2, 120
ppl_termination_test_MS_BD_Shape_int8_t, 96
ppl_termination_test_MS_BD_Shape_int8_t_2, 96
ppl_termination_test_MS_BD_Shape_long_double, 441
ppl_termination_test_MS_BD_Shape_long_double_2, 442
ppl_termination_test_MS_BD_Shape_mpq_class, 136
ppl_termination_test_MS_BD_Shape_mpq_class_2, 136
ppl_termination_test_MS_BD_Shape_mpz_class, 128
ppl_termination_test_MS_BD_Shape_mpz_class_2, 128
ppl_termination_test_MS_C_Polyhedron, 198
ppl_termination_test_MS_C_Polyhedron_2, 198
ppl_termination_test_MS_Double_Box, 395
ppl_termination_test_MS_Double_Box_2, 396
ppl_termination_test_MS_Float_Box, 359
ppl_termination_test_MS_Float_Box_2, 359
ppl_termination_test_MS_Grid, 205
ppl_termination_test_MS_Grid_2, 205
ppl_termination_test_MS_Int16_Box, 37
ppl_termination_test_MS_Int16_Box_2, 37
ppl_termination_test_MS_Int32_Box, 43
ppl_termination_test_MS_Int32_Box_2, 44
ppl_termination_test_MS_Int64_Box, 50
ppl_termination_test_MS_Int64_Box_2, 50
ppl_termination_test_MS_Int8_Box, 31
ppl_termination_test_MS_Int8_Box_2, 31
ppl_termination_test_MS_Long_Double_Box, 433
ppl_termination_test_MS_Long_Double_Box_2, 433
ppl_termination_test_MS_NNC_Polyhedron, 198
ppl_termination_test_MS_NNC_Polyhedron_2, 198
ppl_termination_test_MS_Octagonal_Shape_double, 411
ppl_termination_test_MS_Octagonal_Shape_double_2, 412
ppl_termination_test_MS_Octagonal_Shape_float, 375
ppl_termination_test_MS_Octagonal_Shape_float_2, 375
ppl_termination_test_MS_Octagonal_Shape_int16_t, 153
ppl_termination_test_MS_Octagonal_Shape_int16_t_2, 153
ppl_termination_test_MS_Octagonal_Shape_int32_t, 161
ppl_termination_test_MS_Octagonal_Shape_int32_t_2, 162
ppl_termination_test_MS_Octagonal_Shape_int64_t, 170
ppl_termination_test_MS_Octagonal_Shape_int64_t_2, 170
ppl_termination_test_MS_Octagonal_Shape_int8_t, 144
ppl_termination_test_MS_Octagonal_Shape_int8_t_2, 144
ppl_termination_test_MS_Octagonal_Shape_long_doub
450
ppl_termination_test_MS_Octagonal_Shape_long_doub
450
ppl_termination_test_MS_Octagonal_Shape_mpq_class
187
ppl_termination_test_MS_Octagonal_Shape_mpq_class
188
ppl_termination_test_MS_Octagonal_Shape_mpz_class
179
ppl_termination_test_MS_Octagonal_Shape_mpz_class

179
ppl_termination_test_MS_Rational_Box, 88
ppl_termination_test_MS_Rational_Box_2, 88
ppl_termination_test_MS_Uint16_Box, 62
ppl_termination_test_MS_Uint16_Box_2, 63
ppl_termination_test_MS_Uint32_Box, 69
ppl_termination_test_MS_Uint32_Box_2, 69
ppl_termination_test_MS_Uint64_Box, 75
ppl_termination_test_MS_Uint64_Box_2, 76
ppl_termination_test_MS_Uint8_Box, 56
ppl_termination_test_MS_Uint8_Box_2, 56
ppl_termination_test_MS_Z_Box, 81
ppl_termination_test_MS_Z_Box_2, 81
ppl_termination_test_PR_BD_Shape_double, 403
ppl_termination_test_PR_BD_Shape_double_2, 403
ppl_termination_test_PR_BD_Shape_float, 367
ppl_termination_test_PR_BD_Shape_float_2, 367
ppl_termination_test_PR_BD_Shape_int16_t, 104
ppl_termination_test_PR_BD_Shape_int16_t_2, 104
ppl_termination_test_PR_BD_Shape_int32_t, 112
ppl_termination_test_PR_BD_Shape_int32_t_2, 112
ppl_termination_test_PR_BD_Shape_int64_t, 120
ppl_termination_test_PR_BD_Shape_int64_t_2, 120
ppl_termination_test_PR_BD_Shape_int8_t, 96
ppl_termination_test_PR_BD_Shape_int8_t_2, 96
ppl_termination_test_PR_BD_Shape_long_double, 441
ppl_termination_test_PR_BD_Shape_long_double_2, 442
ppl_termination_test_PR_BD_Shape_mpq_class, 136
ppl_termination_test_PR_BD_Shape_mpq_class_2, 136
ppl_termination_test_PR_BD_Shape_mpz_class, 128
ppl_termination_test_PR_BD_Shape_mpz_class_2, 128
ppl_termination_test_PR_C_Polyhedron, 198
ppl_termination_test_PR_C_Polyhedron_2, 198
ppl_termination_test_PR_Double_Box, 395
ppl_termination_test_PR_Double_Box_2, 396
ppl_termination_test_PR_Float_Box, 359
ppl_termination_test_PR_Float_Box_2, 359
ppl_termination_test_PR_Grid, 205
ppl_termination_test_PR_Grid_2, 205
ppl_termination_test_PR_Int16_Box, 37
ppl_termination_test_PR_Int16_Box_2, 37
ppl_termination_test_PR_Int32_Box, 43
ppl_termination_test_PR_Int32_Box_2, 44
ppl_termination_test_PR_Int64_Box, 50
ppl_termination_test_PR_Int64_Box_2, 50
ppl_termination_test_PR_Int8_Box, 31
ppl_termination_test_PR_Int8_Box_2, 31
ppl_termination_test_PR_Long_Double_Box, 433
ppl_termination_test_PR_Long_Double_Box_2, 433
ppl_termination_test_PR_NNC_Polyhedron, 198
ppl_termination_test_PR_NNC_Polyhedron_2, 198
ppl_termination_test_PR_Octagonal_Shape_double, 411
ppl_termination_test_PR_Octagonal_Shape_double_2, 412
ppl_termination_test_PR_Octagonal_Shape_float, 375
ppl_termination_test_PR_Octagonal_Shape_float_2, 375
ppl_termination_test_PR_Octagonal_Shape_int16_t, 153
ppl_termination_test_PR_Octagonal_Shape_int16_t_2, 153

ppl_termination_test_PR_Octagonal_Shape_Uint32_t, 161
ppl_termination_test_PR_Octagonal_Shape_Uint32_t_2, 162
ppl_termination_test_PR_Octagonal_Shape_Uint64_t, 170
ppl_termination_test_PR_Octagonal_Shape_Uint64_t_2, 170
ppl_termination_test_PR_Octagonal_Shape_Uint8_t, 144
ppl_termination_test_PR_Octagonal_Shape_Uint8_t_2, 144
ppl_termination_test_PR_Octagonal_Shape_long_double, 450
ppl_termination_test_PR_Octagonal_Shape_long_double_2, 450
ppl_termination_test_PR_Octagonal_Shape_mpq_class, 187
ppl_termination_test_PR_Octagonal_Shape_mpq_class_2, 188
ppl_termination_test_PR_Octagonal_Shape_mpz_class, 179
ppl_termination_test_PR_Octagonal_Shape_mpz_class_2, 179
ppl_termination_test_PR_Rational_Box, 88
ppl_termination_test_PR_Rational_Box_2, 88
ppl_termination_test_PR_Uint16_Box, 62
ppl_termination_test_PR_Uint16_Box_2, 63
ppl_termination_test_PR_Uint32_Box, 69
ppl_termination_test_PR_Uint32_Box_2, 69
ppl_termination_test_PR_Uint64_Box, 75
ppl_termination_test_PR_Uint64_Box_2, 76
ppl_termination_test_PR_Uint8_Box, 56
ppl_termination_test_PR_Uint8_Box_2, 56
ppl_termination_test_PR_Z_Box, 81
ppl_termination_test_PR_Z_Box_2, 81
PPL_timeout_exception, 19
ppl_Uint16_Box_add_congruence, 61
ppl_Uint16_Box_add_congruences, 61
ppl_Uint16_Box_add_constraint, 61
ppl_Uint16_Box_add_constraints, 61
ppl_Uint16_Box_add_space_dimensions_and_embed, 62
ppl_Uint16_Box_add_space_dimensions_and_project, 62
ppl_Uint16_Box_affine_dimension, 59
ppl_Uint16_Box_affine_image, 61
ppl_Uint16_Box_affine_preimage, 61
ppl_Uint16_Box_ascii_dump, 62
ppl_Uint16_Box_bounded_affine_image, 61
ppl_Uint16_Box_bounded_affine_preimage, 61
ppl_Uint16_Box_bounds_from_above, 60
ppl_Uint16_Box_bounds_from_below, 60
ppl_Uint16_Box_CC76_widening_assign, 62
ppl_Uint16_Box_CC76_widening_assign_with_tokens, 62
ppl_Uint16_Box_concatenate_assign, 61
ppl_Uint16_Box_constrains, 61
ppl_Uint16_Box_contains_integer_point, 60
ppl_Uint16_Box_contains_Uint16_Box, 60
ppl_Uint16_Box_difference_assign, 61
ppl_Uint16_Box_drop_some_non_integer_points, 62
ppl_Uint16_Box_drop_some_non_integer_points_2, 62
ppl_Uint16_Box_equals_Uint16_Box, 60
ppl_Uint16_Box_expand_space_dimension, 62
ppl_Uint16_Box_external_memory_in_bytes, 62
ppl_Uint16_Box_fold_space_dimensions, 62
ppl_Uint16_Box_frequency, 60
ppl_Uint16_Box_generalized_affine_image, 61
ppl_Uint16_Box_generalized_affine_image_lhs_rhs, 62
ppl_Uint16_Box_generalized_affine_preimage, 61
ppl_Uint16_Box_generalized_affine_preimage_lhs_rh 62
ppl_Uint16_Box_get_congruences, 60
ppl_Uint16_Box_get_constraints, 60
ppl_Uint16_Box_get_minimized_congruences, 60
ppl_Uint16_Box_get_minimized_constraints, 60
ppl_Uint16_Box_intersection_assign, 61
ppl_Uint16_Box_is_bounded, 60
ppl_Uint16_Box_is_discrete, 60

ppl_Uint16_Box_is_disjoint_from_Uint16_Box, 60
ppl_Uint16_Box_is_empty, 60
ppl_Uint16_Box_is_topologically_closed, 60
ppl_Uint16_Box_is_universe, 60
ppl_Uint16_Box_limited_CC76_extrapolation_assign, 62
ppl_Uint16_Box_limited_CC76_extrapolation_assign_with_tokens, 62
ppl_Uint16_Box_linear_partition, 62
ppl_Uint16_Box_map_space_dimensions, 62
ppl_Uint16_Box_maximize, 60
ppl_Uint16_Box_maximize_with_point, 60
ppl_Uint16_Box_minimize, 60
ppl_Uint16_Box_minimize_with_point, 60
ppl_Uint16_Box_OK, 61
ppl_Uint16_Box_refine_with_congruence, 61
ppl_Uint16_Box_refine_with_congruences, 61
ppl_Uint16_Box_refine_with_constraint, 61
ppl_Uint16_Box_refine_with_constraints, 61
ppl_Uint16_Box_relation_with_congruence, 60
ppl_Uint16_Box_relation_with_constraint, 60
ppl_Uint16_Box_relation_with_generator, 60
ppl_Uint16_Box_remove_higher_space_dimensions, 62
ppl_Uint16_Box_remove_space_dimensions, 62
ppl_Uint16_Box_simplify_using_context_assign, 61
ppl_Uint16_Box_space_dimension, 59
ppl_Uint16_Box_strictly_contains_Uint16_Box, 60
ppl_Uint16_Box_swap, 59
ppl_Uint16_Box_time_elapse_assign, 61
ppl_Uint16_Box_topological_closure_assign, 60
ppl_Uint16_Box_total_memory_in_bytes, 62
ppl_Uint16_Box_unconstrain_space_dimension, 61
ppl_Uint16_Box_unconstrain_space_dimensions, 61
ppl_Uint16_Box_upper_bound_assign, 61
ppl_Uint16_Box_upper_bound_assign_if_exact, 61
ppl_Uint16_Box_widening_assign, 62
ppl_Uint16_Box_widening_assign_with_tokens, 62
ppl_Uint16_Box_wrap_assign, 62
ppl_Uint32_Box_add_congruence, 67
ppl_Uint32_Box_add_congruences, 67
ppl_Uint32_Box_add_constraint, 67
ppl_Uint32_Box_add_constraints, 67
ppl_Uint32_Box_add_space_dimensions_and_embed, 68
ppl_Uint32_Box_add_space_dimensions_and_project, 68
ppl_Uint32_Box_affine_dimension, 66
ppl_Uint32_Box_affine_image, 68
ppl_Uint32_Box_affine_preimage, 68
ppl_Uint32_Box_ascii_dump, 68
ppl_Uint32_Box_bounded_affine_image, 68
ppl_Uint32_Box_bounded_affine_preimage, 68
ppl_Uint32_Box_bounds_from_above, 66
ppl_Uint32_Box_bounds_from_below, 66
ppl_Uint32_Box_CC76_widening_assign, 68
ppl_Uint32_Box_CC76_widening_assign_with_tokens, 68
ppl_Uint32_Box_concatenate_assign, 67
ppl_Uint32_Box_constrains, 67
ppl_Uint32_Box_contains_integer_point, 66
ppl_Uint32_Box_contains_Uint32_Box, 67
ppl_Uint32_Box_difference_assign, 67
ppl_Uint32_Box_drop_some_non_integer_points, 68
ppl_Uint32_Box_drop_some_non_integer_points_2, 68
ppl_Uint32_Box_equals_Uint32_Box, 67
ppl_Uint32_Box_expand_space_dimension, 68
ppl_Uint32_Box_external_memory_in_bytes, 68
ppl_Uint32_Box_fold_space_dimensions, 68
ppl_Uint32_Box_frequency, 67
ppl_Uint32_Box_generalized_affine_image, 68
ppl_Uint32_Box_generalized_affine_image_lhs_rhs, 68

ppl_Uint32_Box_generalized_affine_preimage, 68
ppl_Uint32_Box_generalized_affine_preimage_lhs_rhs, 68
ppl_Uint32_Box_get_congruences, 66
ppl_Uint32_Box_get_constraints, 66
ppl_Uint32_Box_get_minimized_congruences, 66
ppl_Uint32_Box_get_minimized_constraints, 66
ppl_Uint32_Box_intersection_assign, 67
ppl_Uint32_Box_is_bounded, 66
ppl_Uint32_Box_is_discrete, 66
ppl_Uint32_Box_is_disjoint_from_Uint32_Box, 67
ppl_Uint32_Box_is_empty, 66
ppl_Uint32_Box_is_topologically_closed, 66
ppl_Uint32_Box_is_universe, 66
ppl_Uint32_Box_limited_CC76_extrapolation_assign, 69
ppl_Uint32_Box_limited_CC76_extrapolation_assign_with_tokens, 69
ppl_Uint32_Box_linear_partition, 69
ppl_Uint32_Box_map_space_dimensions, 68
ppl_Uint32_Box_maximize, 67
ppl_Uint32_Box_maximize_with_point, 67
ppl_Uint32_Box_minimize, 67
ppl_Uint32_Box_minimize_with_point, 67
ppl_Uint32_Box_OK, 67
ppl_Uint32_Box_refine_with_congruence, 67
ppl_Uint32_Box_refine_with_congruences, 67
ppl_Uint32_Box_refine_with_constraint, 67
ppl_Uint32_Box_refine_with_constraints, 67
ppl_Uint32_Box_relation_with_congruence, 66
ppl_Uint32_Box_relation_with_constraint, 66
ppl_Uint32_Box_relation_with_generator, 66
ppl_Uint32_Box_remove_higher_space_dimensions, 68
ppl_Uint32_Box_remove_space_dimensions, 68
ppl_Uint32_Box_simplify_using_context_assign, 67
ppl_Uint32_Box_space_dimension, 66
ppl_Uint32_Box_strictly_contains_Uint32_Box, 67
ppl_Uint32_Box_swap, 66
ppl_Uint32_Box_time_elapse_assign, 67
ppl_Uint32_Box_topological_closure_assign, 66
ppl_Uint32_Box_total_memory_in_bytes, 68
ppl_Uint32_Box_unconstrain_space_dimension, 67
ppl_Uint32_Box_unconstrain_space_dimensions, 68
ppl_Uint32_Box_upper_bound_assign, 67
ppl_Uint32_Box_upper_bound_assign_if_exact, 67
ppl_Uint32_Box_widening_assign, 69
ppl_Uint32_Box_widening_assign_with_tokens, 69
ppl_Uint32_Box_wrap_assign, 69
ppl_Uint64_Box_add_congruence, 73
ppl_Uint64_Box_add_congruences, 73
ppl_Uint64_Box_add_constraint, 73
ppl_Uint64_Box_add_constraints, 73
ppl_Uint64_Box_add_space_dimensions_and_embed, 75
ppl_Uint64_Box_add_space_dimensions_and_project, 75
ppl_Uint64_Box_affine_dimension, 72
ppl_Uint64_Box_affine_image, 74
ppl_Uint64_Box_affine_preimage, 74
ppl_Uint64_Box_ascii_dump, 75
ppl_Uint64_Box_bounded_affine_image, 74
ppl_Uint64_Box_bounded_affine_preimage, 74
ppl_Uint64_Box_bounds_from_above, 73
ppl_Uint64_Box_bounds_from_below, 73
ppl_Uint64_Box_CC76_widening_assign, 75
ppl_Uint64_Box_CC76_widening_assign_with_tokens, 75
ppl_Uint64_Box_concatenate_assign, 74
ppl_Uint64_Box_constrains, 74
ppl_Uint64_Box_contains_integer_point, 73
ppl_Uint64_Box_contains_Uint64_Box, 73
ppl_Uint64_Box_difference_assign, 74
ppl_Uint64_Box_drop_some_non_integer_points, 75

ppl_Uint64_Box_drop_some_non_integer_points, 75
ppl_Uint64_Box_equals_Uint64_Box, 73
ppl_Uint64_Box_expand_space_dimension, 75
ppl_Uint64_Box_external_memory_in_bytes, 75
ppl_Uint64_Box_fold_space_dimensions, 75
ppl_Uint64_Box_frequency, 73
ppl_Uint64_Box_generalized_affine_image, 74
ppl_Uint64_Box_generalized_affine_image_lhs_rhs, 74
ppl_Uint64_Box_generalized_affine_preimage, 74
ppl_Uint64_Box_generalized_affine_preimage_lhs_rhs, 74
ppl_Uint64_Box_get_congruences, 73
ppl_Uint64_Box_get_constraints, 73
ppl_Uint64_Box_get_minimized_congruences, 73
ppl_Uint64_Box_get_minimized_constraints, 73
ppl_Uint64_Box_intersection_assign, 74
ppl_Uint64_Box_is_bounded, 73
ppl_Uint64_Box_is_discrete, 73
ppl_Uint64_Box_is_disjoint_from_Uint64_Box, 73
ppl_Uint64_Box_is_empty, 73
ppl_Uint64_Box_is_topologically_closed, 73
ppl_Uint64_Box_is_universe, 73
ppl_Uint64_Box_limited_CC76_extrapolation_assign, 75
ppl_Uint64_Box_limited_CC76_extrapolation_assign_with_tokens, 75
ppl_Uint64_Box_linear_partition, 75
ppl_Uint64_Box_map_space_dimensions, 75
ppl_Uint64_Box_maximize, 73
ppl_Uint64_Box_maximize_with_point, 73
ppl_Uint64_Box_minimize, 73
ppl_Uint64_Box_minimize_with_point, 73
ppl_Uint64_Box_OK, 73
ppl_Uint64_Box_refine_with_congruence, 74
ppl_Uint64_Box_refine_with_congruences, 74
ppl_Uint64_Box_refine_with_constraint, 74
ppl_Uint64_Box_refine_with_constraints, 74
ppl_Uint64_Box_relation_with_congruence, 73
ppl_Uint64_Box_relation_with_constraint, 72
ppl_Uint64_Box_relation_with_generator, 72
ppl_Uint64_Box_remove_higher_space_dimensions, 75
ppl_Uint64_Box_remove_space_dimensions, 75
ppl_Uint64_Box_simplify_using_context_assign, 74
ppl_Uint64_Box_space_dimension, 72
ppl_Uint64_Box_strictly_contains_Uint64_Box, 73
ppl_Uint64_Box_swap, 72
ppl_Uint64_Box_time_elapse_assign, 74
ppl_Uint64_Box_topological_closure_assign, 73
ppl_Uint64_Box_total_memory_in_bytes, 75
ppl_Uint64_Box_unconstrain_space_dimension, 74
ppl_Uint64_Box_unconstrain_space_dimensions, 74
ppl_Uint64_Box_upper_bound_assign, 74
ppl_Uint64_Box_upper_bound_assign_if_exact, 74
ppl_Uint64_Box_widening_assign, 75
ppl_Uint64_Box_widening_assign_with_tokens, 75
ppl_Uint64_Box_wrap_assign, 75
ppl_Uint8_Box_add_constraint_and_minimize, 54
ppl_Uint8_Box_add_congruences, 54
ppl_Uint8_Box_add_constraint, 54
ppl_Uint8_Box_add_constraints, 54
ppl_Uint8_Box_add_space_dimensions_and_embed, 55
ppl_Uint8_Box_add_space_dimensions_and_project, 55
ppl_Uint8_Box_affine_dimension, 53
ppl_Uint8_Box_affine_image, 55
ppl_Uint8_Box_affine_preimage, 55
ppl_Uint8_Box_ascii_dump, 55
ppl_Uint8_Box_bounded_affine_image, 55
ppl_Uint8_Box_bounded_affine_preimage, 55
ppl_Uint8_Box_bounds_from_above, 54
ppl_Uint8_Box_bounds_from_below, 54

ppl_Uint8_Box_CC76_widening_assign, 56
ppl_Uint8_Box_CC76_widening_assign_with_tokens, 56
ppl_Uint8_Box_concatenate_assign, 54
ppl_Uint8_Box_constrains, 55
ppl_Uint8_Box_contains_integer_point, 54
ppl_Uint8_Box_contains_Uint8_Box, 54
ppl_Uint8_Box_difference_assign, 54
ppl_Uint8_Box_drop_some_non_integer_points, 55
ppl_Uint8_Box_drop_some_non_integer_points_2, 55
ppl_Uint8_Box_equals_Uint8_Box, 54
ppl_Uint8_Box_expand_space_dimension, 55
ppl_Uint8_Box_external_memory_in_bytes, 56
ppl_Uint8_Box_fold_space_dimensions, 55
ppl_Uint8_Box_frequency, 54
ppl_Uint8_Box_generalized_affine_image, 55
ppl_Uint8_Box_generalized_affine_image_lhs_rhs, 55
ppl_Uint8_Box_generalized_affine_preimage, 55
ppl_Uint8_Box_generalized_affine_preimage_lhs_rhs, 55
ppl_Uint8_Box_get_congruences, 53
ppl_Uint8_Box_get_constraints, 53
ppl_Uint8_Box_get_minimized_congruences, 53
ppl_Uint8_Box_get_minimized_constraints, 53
ppl_Uint8_Box_intersection_assign, 54
ppl_Uint8_Box_is_bounded, 53
ppl_Uint8_Box_is_discrete, 54
ppl_Uint8_Box_is_disjoint_from_Uint8_Box, 54
ppl_Uint8_Box_is_empty, 53
ppl_Uint8_Box_is_topologically_closed, 54
ppl_Uint8_Box_is_universe, 53
ppl_Uint8_Box_limited_CC76_extrapolation_assign, 56
ppl_Uint8_Box_limited_CC76_extrapolation_assign_with_tokens, 56
ppl_Uint8_Box_linear_partition, 56
ppl_Uint8_Box_map_space_dimensions, 55
ppl_Uint8_Box_maximize, 54
ppl_Uint8_Box_maximize_with_point, 54
ppl_Uint8_Box_minimize, 54
ppl_Uint8_Box_minimize_with_point, 54
ppl_Uint8_Box_OK, 54
ppl_Uint8_Box_refine_with_congruence, 54
ppl_Uint8_Box_refine_with_congruences, 54
ppl_Uint8_Box_refine_with_constraint, 54
ppl_Uint8_Box_refine_with_constraints, 54
ppl_Uint8_Box_relation_with_congruence, 53
ppl_Uint8_Box_relation_with_constraint, 53
ppl_Uint8_Box_relation_with_generator, 53
ppl_Uint8_Box_remove_higher_space_dimensions, 55
ppl_Uint8_Box_remove_space_dimensions, 55
ppl_Uint8_Box_simplify_using_context_assign, 55
ppl_Uint8_Box_space_dimension, 53
ppl_Uint8_Box_strictly_contains_Uint8_Box, 54
ppl_Uint8_Box_swap, 53
ppl_Uint8_Box_time_elapse_assign, 54
ppl_Uint8_Box_topological_closure_assign, 54
ppl_Uint8_Box_total_memory_in_bytes, 56
ppl_Uint8_Box_unconstrain_space_dimension, 55
ppl_Uint8_Box_unconstrain_space_dimensions, 55
ppl_Uint8_Box_upper_bound_assign, 54
ppl_Uint8_Box_upper_bound_assign_if_exact, 55
ppl_Uint8_Box_widening_assign, 56
ppl_Uint8_Box_widening_assign_with_tokens, 56
ppl_Uint8_Box_wrap_assign, 56
PPL_unexpected_error, 19
PPL_unknown_standard_exception, 19
ppl_version, 21
ppl_version_beta, 21
ppl_version_major, 21
ppl_version_minor, 21
ppl_version_revision, 21
ppl_Z_Box_add_congruence, 80

ppl_Z_Box_add_congruences, 80
ppl_Z_Box_add_constraint, 79
ppl_Z_Box_add_constraints, 80
ppl_Z_Box_add_space_dimensions_and_embed, 80
ppl_Z_Box_add_space_dimensions_and_project, 80
ppl_Z_Box_affine_dimension, 79
ppl_Z_Box_affine_image, 80
ppl_Z_Box_affine_preimage, 80
ppl_Z_Box_ascii_dump, 81
ppl_Z_Box_bounded_affine_image, 80
ppl_Z_Box_bounded_affine_preimage, 80
ppl_Z_Box_bounds_from_above, 79
ppl_Z_Box_bounds_from_below, 79
ppl_Z_Box_CC76_widening_assign, 81
ppl_Z_Box_CC76_widening_assign_with_tokens, 81
ppl_Z_Box_concatenate_assign, 80
ppl_Z_Box_constrains, 80
ppl_Z_Box_contains_integer_point, 79
ppl_Z_Box_contains_Z_Box, 79
ppl_Z_Box_difference_assign, 80
ppl_Z_Box_drop_some_non_integer_points, 81
ppl_Z_Box_drop_some_non_integer_points_2, 81
ppl_Z_Box_equals_Z_Box, 79
ppl_Z_Box_expand_space_dimension, 81
ppl_Z_Box_external_memory_in_bytes, 81
ppl_Z_Box_fold_space_dimensions, 81
ppl_Z_Box_frequency, 79
ppl_Z_Box_generalized_affine_image, 80
ppl_Z_Box_generalized_affine_image_lhs_rhs, 80
ppl_Z_Box_generalized_affine_preimage, 80
ppl_Z_Box_generalized_affine_preimage_lhs_rhs, 80
ppl_Z_Box_get_congruences, 79
ppl_Z_Box_get_constraints, 79
ppl_Z_Box_get_minimized_congruences, 79
ppl_Z_Box_get_minimized_constraints, 79
ppl_Z_Box_intersection_assign, 80
ppl_Z_Box_is_bounded, 79
ppl_Z_Box_is_discrete, 79
ppl_Z_Box_is_disjoint_from_Z_Box, 79
ppl_Z_Box_is_empty, 79
ppl_Z_Box_is_topologically_closed, 79
ppl_Z_Box_is_universe, 79
ppl_Z_Box_limited_CC76_extrapolation_assign, 81
ppl_Z_Box_limited_CC76_extrapolation_assign_with_
81
ppl_Z_Box_linear_partition, 81
ppl_Z_Box_map_space_dimensions, 81
ppl_Z_Box_maximize, 79
ppl_Z_Box_maximize_with_point, 79
ppl_Z_Box_minimize, 79
ppl_Z_Box_minimize_with_point, 79
ppl_Z_Box_OK, 79
ppl_Z_Box_refine_with_congruence, 80
ppl_Z_Box_refine_with_congruences, 80
ppl_Z_Box_refine_with_constraint, 80
ppl_Z_Box_refine_with_constraints, 80
ppl_Z_Box_relation_with_congruence, 79
ppl_Z_Box_relation_with_constraint, 79
ppl_Z_Box_relation_with_generator, 79
ppl_Z_Box_remove_higher_space_dimensions, 81
ppl_Z_Box_remove_space_dimensions, 81
ppl_Z_Box_simplify_using_context_assign, 80
ppl_Z_Box_space_dimension, 79
ppl_Z_Box_strictly_contains_Z_Box, 79
ppl_Z_Box_swap, 78
ppl_Z_Box_time_elapse_assign, 80
ppl_Z_Box_topological_closure_assign, 79
ppl_Z_Box_total_memory_in_bytes, 81
ppl_Z_Box_unconstrain_space_dimension, 80
ppl_Z_Box_unconstrain_space_dimensions, 80
ppl_Z_Box_upper_bound_assign, 80
ppl_Z_Box_upper_bound_assign_if_exact, 80
ppl_Z_Box_widening_assign, 81
ppl_Z_Box_widening_assign_with_tokens, 81
ppl_Z_Box_wrap_assign, 81

rational_box, 24
relation_symbol, 20

relation_with_congruence, 20

uint16_box, 24
uint32_box, 24
uint64_box, 24
uint8_box, 24

z_box, 24