Quantifier elimination (QE) is the main technique to eliminate quantifiers of a formula F until only a quantifier-free formula G that is equivalent to F remains.

**Ex: Consider the formula**

F : ∃x. 2x = y

which expresses the set of rationals y that can be halved. Intuitively, all rationals can be halved, so a quantifier-free equivalent formula is :

G : ⊤

which expresses the set of all rationals. Also, G states that F is valid.

**Ex2: Consider the same formula**

F : ∃x. 2x = y ,

which expresses the set of integers y that can be halved (to produce another integer). Intuitively, only even integers can be halved.

For example, an equivalent formula to F is

G : 2 | y ,

which expresses the set of even integers: integers that are divisible by 2.

A disadvantage of using quantifier elimination is the size of the result after elimination.

In general, the final result after elimination is a boolean combination of, mostly unfactorized, polynomial equalities and inequalities, containing redundant non-linear inequalities that need to be detected and removed.

If the polynomials in the result are linear => double description method to compute a minimal set of generators

If there are irredundant and unfactorizable non-linear constraints