Skolemization –

Process of converting any predicate calculus wff formula to a set of clauses.

Example:

$(\forall x)[P(x) \rightarrow ((\forall y)[P(y) \rightarrow P(f(x,y))])] \wedge (\forall y)[Q(x,y) \rightarrow P(y)]$

Eliminate implication symbols

$(\forall x)[\neg P(x) \vee ((\forall y)[\neg P(y) \vee P(f(x,y)])] \wedge (\forall y)[\neg Q(x,y) \vee P(y)]$

Reduce scopes of negation symbols (can be applied only to atomic formulas)

$(\forall x)[\neg P(x) \vee ((\forall y)[\neg P(y) \vee P(f(x,y)])] \wedge (\forall y)[\neg Q(x,y) \vee P(y)]$

Standardize variables

$(\forall x)[\neg P(x) \vee ((\forall y)[\neg P(y) \vee P(f(x,y)])] \wedge (\forall z)[\neg Q(w,z) \vee P(z)]$

Elimínate existencial quantifiers (introduce Skolem functions)

$(\forall x)[\neg P(x) \vee ((\forall y)[\neg P(y) \vee P(f(x,y)])] \wedge (\forall z)[\neg Q(w,z) \vee P(z)]$

Move universal quantifiers to the front

$(\forall x)(\forall y)(\forall z)[\neg P(x) \vee ([\neg P(y) \vee P(f(x,y)])] \wedge [\neg Q(w,z) \vee P(z)]$

Elimínate universal quantifiers

$[\neg P(x) \vee ([\neg P(y) \vee P(f(x,y)])] \wedge [\neg Q(w,z) \vee P(z)]$

Convert to conjunctive normal form

$[\neg P(x) \vee \neg P(y) \vee P(f(x,y)] \wedge [\neg Q(w,z) \vee P(z)]$

Elimínate "$\wedge$" symbol

$\neg P(x) \vee \neg P(y) \vee P(f(x,y), \ \neg Q(w,z) \vee P(z)$

Rename variables

$\neg P(x) \vee \neg P(y) \vee P(f(x,y), \ \neg Q(w,z) \vee P(z)$