

Summary of the Negation Rules of Algebra and Logic

Negation Rules from Algebra
$\sim(x = y) \Leftrightarrow (x \neq y)$
$\sim(x \neq y) \Leftrightarrow (x = y)$
$\sim(x < y) \Leftrightarrow (x \geq y)$
$\sim(x \leq y) \Leftrightarrow (x > y)$
$\sim(x > y) \Leftrightarrow (x \leq y)$
$\sim(x \geq y) \Leftrightarrow (x < y)$

Negation Rules from Propositional Logic
$\sim(\sim p) \Leftrightarrow p$
$\sim(p \wedge q) \Leftrightarrow (\sim p \vee \sim q)$ (DeMorgan's law for <i>and</i>)
$\sim(p \vee q) \Leftrightarrow (\sim p \wedge \sim q)$ (DeMorgan's law for <i>or</i>)
$\sim(p \rightarrow q) \Leftrightarrow (p \wedge \sim q)$

The Negation Rules of Predicate Logic
$\sim(\forall x \in X)P(x) \Leftrightarrow (\exists x \in X)\sim P(x)$
$\sim(\exists x \in X)P(x) \Leftrightarrow (\forall x \in X)\sim P(x)$