

Logical Operators

Not	Negation	NOT	\neg
And	Conjunction	AND	\wedge
Or	Disjunction	OR	\vee
Exclusive Or	N/A	XOR	\oplus
N/A	Implication	IMPLIES	\rightarrow
Equal	Equivalence	EQUAL	\leftrightarrow

Precedence

NOT
AND, NAND
OR, NOR
IMPLIES
EQUAL, XOR

Commutativity

$A \text{ op } B == B \text{ op } A$
Works for AND, OR, EQUAL, XOR, NAND, and NOR

The only operator that isn't commutative is IMPLIES

Associativity

$A \text{ op } (B \text{ op } C) == (A \text{ op } B) \text{ op } C$
Works for AND, OR, EQUAL, and XOR.

Distributivity

$A \vee (B \wedge C) == (A \vee B) \wedge (A \vee C)$
 $A \wedge (B \vee C) == (A \wedge B) \vee (A \wedge C)$

Implies Truth Table

A	B	Result
False	False	True
True	False	False
False	True	True
True	True	True

Equivalents Formulae

$A \leftrightarrow B == (A \rightarrow B) \wedge (B \rightarrow A)$
 $A \oplus B == \neg(A \rightarrow B) \vee \neg(B \rightarrow A)$
 $A \rightarrow B == \neg A \vee B$
 $A \rightarrow B == \neg(A \wedge \neg B)$
 $A \vee B == \neg(\neg A \wedge \neg B)$
 $A \vee B == \neg A \rightarrow B$
 $A \wedge B == \neg(\neg A \vee \neg B)$
 $A \wedge B == \neg(A \rightarrow \neg B)$

Sementic Tableaux

If you are asked to **prove** something with sementic tableaux, negate the formulae first.

If you are asked to **refute** something with the sementic tableaux, **do not** negate the formulae.

C

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