Logical Operators

Not	Negation	NOT	¬
And	Conjunction	AND	∧
Or	Disjunction	OR	∨
Exclusive Or	N/A	XOR	⊕
N/A	Implication	IMPLIES	→
Equal	Equivalence	EQUAL	↔

Precedence

NOT

AND, NAND

OR, NOR

IMPLIES

EQUAL, XOR

Commutativity

`A op B == B op A`

Works for AND, OR, EQUAL, XOR, NAND, and NOR

The only operator that isn't commutative is IMPLIES

Associativity

`A op (B op C) == (A op B) op C`

Works for AND, OR, EQUAL, and XOR.

Distributivity

A ∨ (B ∧ C)	==	(A ∨ B) ∧ (A ∨ C)
A ∧ (B ∨ C)	==	(A ∧ B) ∨ (A ∧ C)

Implies Truth Table

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

Equivalents Formulae

A ↔ B	==	(A → B) ∧ (B → A)
A ⊕ B	==	¬(A → B) ∨ ¬(B → A)
A → B	==	¬A ∨ B
A → B	==	¬(A ∧ ¬B)
A ∨ B	==	¬(¬A ∧ ¬B)
A ∨ B	==	¬A → B
A ∧ B	==	¬(¬A ∨ ¬B)
A ∧ B	==	¬(A → ¬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.

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