

### 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.

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