

Logical Connectives and Truth Tables

Symbol	Name	Read as
\sim	Negation	Not
\vee	Disjunction	Or
\wedge	Conjunction	And
\rightarrow	Conditional	Implies
\leftrightarrow	Bi-conditional	If and only if

Negation, \sim

If p is a true statement, then the truth value of $\sim p$ is F.

If p is a false statement, then the truth value of $\sim p$ is T.

p	$\sim p$
T	F
F	T

Example: p : n is an even number. $\sim p$: n is not an even number.

p	q	$p \vee q$	$p \wedge q$	$p \rightarrow q$	$p \leftrightarrow q$
T	T	T	T	T	T
T	F	T	F	F	F
F	T	T	F	T	F
F	F	F	F	T	T

$p \vee q$ “False” only when both p and q are false.

$p \wedge q$ “True” only when both simple statements are true.

$p \rightarrow q$ “False” only when the hypothesis(p) is true and the conclusion(q) is false.

$p \leftrightarrow q$ “True” only when the component statements have the same truth value.