The Bright Side of Mathematics
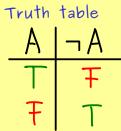
Start Learning Logic – Part 1

Logical statement (proposition):   Statement that is either True or False

Examples: (a) Mars is a planet (True logical statement)

(b) Pluto is a planet (False logical statement)

(c) $1 + 1 = 2$ (True logical statement)

(d) The number 5 is smaller than the number 2 (False logical statement)

(e) Good morning! (Not a logical statement)

(f) $X + 1 = 1$ (Not a logical statement) ⤳ predicate

Logical operations:

Negation: For a logical statement A,

$\neg A$ denotes the negation.

Truth table

A	$\neg A$
T	F
F	T

Examples: (a) A = The wine bottle is full

$\neg A$ = The wine bottle is not full

(b) $A = 2 + 2 = 5$

$\neg A = 2 + 2 \neq 5$

Conjunction: For two logical statements $A, B,$

$A \wedge B$ denotes the conjuction.

Truth table

A	B	$A \wedge B$
T	T	T
T	F	F
F	T	F
F	F	F

battery   A   B   ⊗ lamp