



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) $\rightsquigarrow$ predicate

Logical operations:

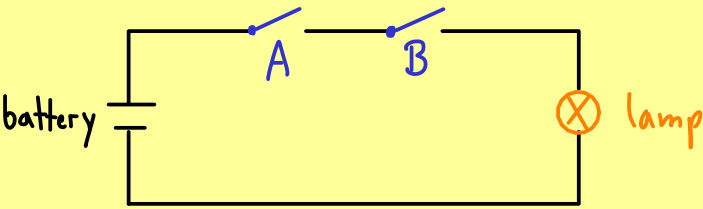
Negation: For a logical statement A ,
 $\neg A$ denotes the negation.

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 conjunction.



Truth table

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