



The Bright Side of Mathematics

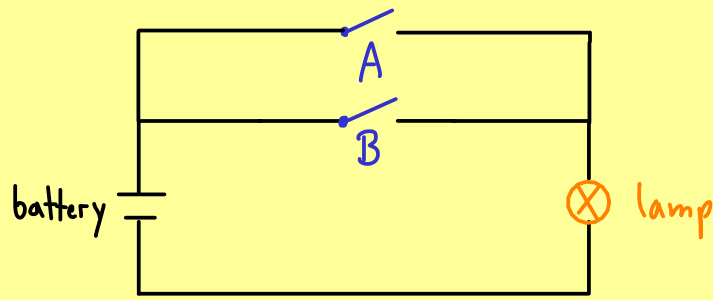
Start Learning Logic - Part 2

Logical statements $A, B \rightsquigarrow$ new logical statements $\neg A, A \vee B$

logical variables A, B
 logical operations \neg, \vee

Logical operations:

Disjunction: For two logical statements A, B , $A \vee B$ denotes the disjunction.



Truth table

A	B	$A \vee B$
T	T	T
T	F	T
F	T	T
F	F	F

Example: $\neg A \vee A$

Truth table

A	$\neg A$	$\neg A \vee A$
T	F	T
F	T	T

We say $\neg A \vee A$ is a tautology.

↳ always true (independent of the truth values of the logical variables that are contained)

Logical equivalence: Two logical statements are called logically equivalent if the truth tables (all possible assignments of truth values for the logical variables) are the same.

Example: $\neg(A \vee B) \Leftrightarrow (\neg A) \wedge (\neg B)$

A	B	$A \vee B$	$\neg A$	$\neg B$	$\neg(A \vee B)$	$\neg A \wedge \neg B$
T	T	T	F	F	F	F
T	F	T	F	T	F	F
F	T	T	T	F	F	F
F	F	F	T	T	T	T