

Section 1.6: Logical Equivalence

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11:04 AM

consider the propositions p & q :

\Rightarrow there are four combinations of the possible values of p & q since each can either be true or false.

truth table: (extremely long-winded version) ↙ don't use this

p	q	$p \wedge q$	$p \vee q$
false	false	false	false
false	true	false	true
true	false	false	true
true	true	true	true

really terse version: true = 1 and false = 0

will use this ↗

p	q	$p \wedge q$	$p \vee q$	$p \oplus q$	\bar{p}	$\overline{p \wedge q}$
0	0	0	0	0	1	1
0	1	0	1	1	1	1
1	0	0	1	1	0	1
1	1	1	1	0	0	0

example: write the truth table for $p \wedge \bar{p}$:

p	\bar{p}	$p \wedge \bar{p}$
0	1	0
1	0	0

now, use that table to simplify $p \wedge \bar{p}$

$$p \wedge \bar{p} \iff 0$$

↑

"is logically equivalent to"