

Math 150

Section 3.3 The Conditional and Circuits

Definition A A conditional statement is a compound statement that uses the connective “if \dots then.”

“If p , then q ” is symbolized $p \rightarrow q$. We can also read $p \rightarrow q$ as “ p implies q .”

In the conditional $p \rightarrow q$, the statement p is the antecedent and q is the consequent.

Example 1 Write the statements in “if, then” form and identify the antecedent and consequent.

All Marines love boot camp.

It must be alive if it is breathing.

Truth Table for $p \rightarrow q$

p	q	$p \rightarrow q$
T	T	T
T	F	F
F	T	T
F	F	T

Negation of a Conditional

p	q	$p \rightarrow q$	$\sim(p \rightarrow q)$	$p \wedge \sim q$
T	T	T	F	F
T	F	F	T	T
F	T	T	F	F
F	F	T	F	F

A tautology is a statement that is always true.

Example 2 Negate the following conditional: “If you build it, they will come.”