

M260 1.2

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Conditional Statements

Deductive reasoning proceeds from a _____ to a _____.

If p then q is false only when _____.

Truth table for "If p then q."

p	q	$p \rightarrow q$

"If p then q" is vacuously true when _____.

The order of operations for our logical operators is first _____,
then _____, and finally _____.

Truth table for $p \vee \sim q \rightarrow \sim p$:

Restate the following as an English statement:

$$p \vee q \rightarrow r \equiv (p \rightarrow r) \wedge (q \rightarrow r)$$

Truth table showing $p \rightarrow q \equiv \sim p \vee q$

The negation of the conditional $p \rightarrow q$ is

$\sim(p \rightarrow q) \equiv$ _____.

For the conditional $p \rightarrow q$, fill in the blanks and connect those which are equivalent:

Conditional $p \rightarrow q$

Contrapositive _____.

Converse _____.

Inverse _____.

Give a specific conditional then write its contrapositive, converse, and inverse:

Conditional: _____.

Contrapositive: _____.

Converse: _____.

Inverse: _____.

Rewrite the only if statement using equivalent if then statements:

John will break the world's record for the mile only if he runs the mile in under four minutes.

Rewrite the following as the conjunction of two if-then statements:

"This computer program is correct if, and only if, it produces the correct answer for all possible sets of input data."

Rewrite the following statement in the if-then form:

"Pia's birth on U.S. soil is a sufficient condition for her to be a U.S. citizen."

Rewrite the following statement in the if-then form:

"George's attaining age 35 is a necessary condition for his being the president of the United States."
