

The **negation** of a statement p is the opposite of the statement. The symbol is $\sim p$ and is read "not p ." The negation of the statement "The sky is blue" is "The sky is *not* blue." You can use negations to write statements related to a conditional. Every conditional has three related conditional statements.

Take note

Key Concept Related Conditional Statements

Statement	How to Write It	Example	Symbols	How to Read It
Conditional	Use the given hypothesis and conclusion.	If $m\angle A = 15$, then $\angle A$ is acute.	$p \rightarrow q$	If p , then q .
Converse	Exchange the hypothesis and the conclusion.	If $\angle A$ is acute, then $m\angle A = 15$.	$q \rightarrow p$	If q , then p .
Inverse	Negate both the hypothesis and the conclusion of the conditional.	If $m\angle A \neq 15$, then $\angle A$ is not acute.	$\sim p \rightarrow \sim q$	If not p , then not q .
Contrapositive	Negate both the hypothesis and the conclusion of the converse.	If $\angle A$ is not acute, then $m\angle A \neq 15$.	$\sim q \rightarrow \sim p$	If not q , then not p .

Below are the truth values of the related statements above. **Equivalent statements** have the same truth value.

Statement	Example	Truth Value
Conditional	If $m\angle A = 15$, then $\angle A$ is acute.	True
Converse	If $\angle A$ is acute, then $m\angle A = 15$.	False
Inverse	If $m\angle A \neq 15$, then $\angle A$ is not acute.	False
Contrapositive	If $\angle A$ is not acute, then $m\angle A \neq 15$.	True

A conditional and its contrapositive are equivalent statements. They are either both true or both false. The converse and inverse of a statement are also equivalent statements.