

The Inverse and Contrapositive of a Statements

Given a **Conditional Statement** $p \rightarrow q$

The **Inverse** can be expressed as $\sim p \rightarrow \sim q$

To create the **Inverse** negate the **hypothesis**, p and negate the **conclusion**, q .

Conditional Statement:

$$p \rightarrow q$$

if p , then q

Inverse:

$$\sim p \rightarrow \sim q$$

if not p , then not q

If $\angle 1$ and $\angle 2$ are complementary $\angle$ s,
then $m\angle 1 + m\angle 2 = 90^\circ$.

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If B is between A and C ,
then $AB + BC = AC$.

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If $\angle 1$ and $\angle 2$ are adjacent angles,
then $\angle 1$ and $\angle 2$ have a common vertex.

Given a Conditional Statement $p \rightarrow q$

The Contrapositive can be expressed as $\sim q \rightarrow \sim p$

To create the Contrapositive negate the hypothesis, p and negate the conclusion, q .
then switch to create $\sim q \rightarrow \sim p$.

Conditional Statement:

$$p \rightarrow q$$

if p , then q

Contrapositive:

$$\sim q \rightarrow \sim p$$

if not q , then not p

If $\angle 1$ and $\angle 2$ are adjacent angles,
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Conditional Statement:

$$p \rightarrow q$$

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Contrapositive:

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If $\angle 1$ and $\angle 2$ are supplementary $\angle$ s,
then $m\angle 1 + m\angle 2 = 180^\circ$.

Conditional Statement: $p \rightarrow q$

If $m\angle ABC = 37^\circ$, then $\angle ABC$ is an acute angle.

Converse: $q \rightarrow p$

Inverse: $\sim p \rightarrow \sim q$

Contrapositive: $\sim q \rightarrow \sim p$

Conditional Statement: $p \rightarrow q$

If $m\overline{AB} = m\overline{XY}$, then $\overline{AB} \cong \overline{XY}$.

Converse: $q \rightarrow p$

Inverse: $\sim p \rightarrow \sim q$

Contrapositive: $\sim q \rightarrow \sim p$