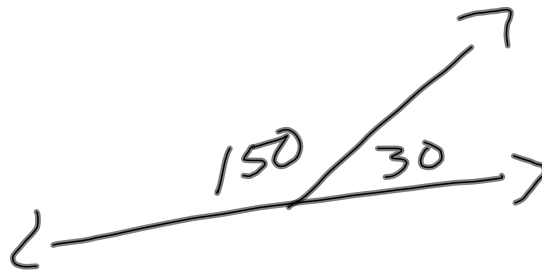


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ws Packet from Fr.

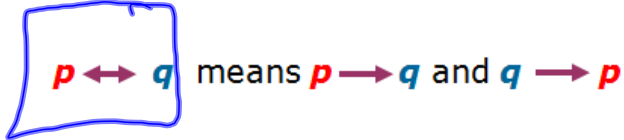


original \rightarrow If, then statement

When you combine a conditional statement and its converse, you create a **biconditional statement**.

A **biconditional statement** is a statement that can be written in the form " **p if and only if q** ." This means "if p , then q " and "if q , then p ."

B.conditional



Writing Math

The biconditional "p if and only if q" can also be written as "p iff q" or $p \leftrightarrow q$.

Write the conditional statement and converse within the biconditional.

An angle is obtuse if and only if its measure is greater than 90° and less than 180° .

Let p and q represent the following.

p : An angle is obtuse.

q : An angle's measure is greater than 90° and less than 180° .

The two parts of the biconditional $p \leftrightarrow q$ are $p \rightarrow q$ and $q \leftarrow p$.

Conditional: **If an \angle is obtuse, then its measure is greater than 90° and less than 180° .**

Converse: **If an angle's measure is greater than 90° and less than 180° , then it is obtuse.**

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#2

Write the conditional statement and converse within the biconditional.

Let x and y represent the following.

x : **A solution is neutral.**

y : **A solution's pH is 7.**

The two parts of the biconditional $x \leftrightarrow y$ are $x \rightarrow y$ and $y \rightarrow x$.

Conditional: **If a solution is neutral, then its pH is 7.**

Converse: **If a solution's pH is 7, then it is neutral.**

For each conditional, write the converse and a biconditional statement.

A. If $5x - 8 = 37$, then $x = 9$.

Converse: If $x = 9$, then $5x - 8 = 37$.

Biconditional: $5x - 8 = 37$ if and only if $x = 9$.

B. If two angles have the same measure, then they are congruent.

Converse: If two angles are congruent, then they have the same measure.

Biconditional: Two angles have the same measure if and only if they are congruent.

For the conditional, write the converse and a biconditional statement.

If the date is July 4th, then it is Independence Day.

Converse: If it is Independence Day, then the date is July 4th.

Biconditional: It is July 4th if and only if it is Independence Day.

For a biconditional statement to be true, both the conditional statement and its converse must be true. If either the conditional or the converse is false, then the biconditional statement is false.



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Determine if the biconditional is true. If false, give a counterexample.

A rectangle has side lengths of 12 cm and 25 cm if and only if its area is 300 cm².

converse is false so false



lengths of 10 & 30.

False

Determine if the biconditional is true. If false, give a counterexample.

A natural number n is odd $\leftrightarrow n^2$ is odd.

Conditional: If a natural number n is odd, then n^2 is odd. *The conditional is true.*

Converse: If the square n^2 of a natural number is odd, then n is odd. *The converse is true.*

Since the conditional and its converse are true, the biconditional is true.

Determine if the biconditional is true. If false, give a counterexample.

An angle is a right angle iff its measure is 90° .

Conditional: If an angle is a right angle, then its measure is 90° . *The conditional is true.*

Converse: If the measure of an angle is 90° , then it is a right angle. *The converse is true.*

Since the conditional and its converse are true, the biconditional is true.

Determine if the biconditional is true. If false, give a counterexample.

$y = -5 \leftrightarrow y^2 = 25$

Conditional: If $y = -5$, then $y^2 = 25$. *The conditional is true.*

Converse: If $y^2 = 25$, then $y = -5$. *The converse is false.*

The converse is false when $y = 5$. Thus, the biconditional is false.

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2-17, 38-40