

Biconditional Statements

Writing a Converse and a Biconditional from a Conditional Statement

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

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

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

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

Converse- If two \sphericalangle 's are \cong then they have the same measure

Biconditional- $5x - 8 = 37$ iff $x = 9$

Biconditional- 2 \sphericalangle 's are \cong iff they have the same measure

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

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

Converse- _____

Biconditional- _____

2. If points lie on the same line, then they are collinear.

Converse- _____

Biconditional- _____

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

iff or \iff

Analyzing the Truth Value of a Biconditional Statement

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

1. A rectangle has side lengths of 12 cm and 25 cm if and only if its area is 300 cm^2 .

Conditional- _____

Converse- it could be 30×10

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

Conditional- ✓

Converse- ✓

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

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

Conditional- ✓

Converse- ✓

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

Conditional- ✓

Converse- NO, y could be 5

In geometry, biconditional statements are used to write proofs.

Writing Definitions as Biconditional Statements

Write each definition as a biconditional.

A right angle measures 90° .

Biconditional- An angle is a right angle iff it is 90° .

Write each definition as a biconditional:

A. A quadrilateral is a four-sided polygon.

Biconditional- A polygon is a quadrilateral iff it is a 4 sided polygon

B. The measure of a straight angle is 180° .

Biconditional- An \angle measures 180° iff it is a straight \angle .

