

If a figure is a triangle, then it has exactly three sides.

Is this conditional true?

yes

Write the converse.

If it has three sides, then
it is a triangle

Is the converse true? If no, give a counterexample.

True

Section 2-2 Biconditionals

If a figure is a triangle, then it has exactly three sides.

If a figure has exactly three sides, then it is a triangle.

Since both this conditional and its converse are true we can write them together to create a **BICONDITIONAL**:

a biconditional connects the conditional and its converse using the word **AND**

A figure is a triangle if and only if it has exactly three sides

A figure is a triangle if and only if it has exactly three sides

an abbreviation for "if and only if" is:

iff

A figure is a triangle iff it has exactly three sides

Is the conditional and its converse both true?

If a number is greater than zero, then it is positive.

If a number is positive, then it is greater than zero.

If no, give a counterexample.

If yes, write them as a biconditional.

A # is positive iff it is greater than zero

Finish this biconditional

A number is even if and only if it's a mult. of 2

Write the two conditionals that make up this biconditional.

If it's a multiple of 2, then it's even

If it's even, then it's a multiple of 2

| Statement | Symbolically |
|---|-----------------------|
| Conditional "if p, then q" | $p \rightarrow q$ |
| Converse "if q, then p" | $q \rightarrow p$ |
| Biconditional "p iff q" | $p \leftrightarrow q$ |

Good Definitions:

- Clearly understood
- Precise
- Makes a true Biconditional.
(Good definitions are reverseible)

Is this a good definition of Parallel Lines?

Two lines are parallel iff they don't intersect

Write the two conditionals that form this biconditional

1. If lines don't intersect, then they are \parallel
2. If lines are \parallel , then they don't intersect

Are they both true?

Conditional #1 is false.

NO, lines could be skew

Is this a good definition of a square?

A figure is a square iff it has four right angles.

Write the two conditionals that make up this biconditional

If it has 4 RT \angle s, then it's a Sq.
If, then

Write a good definition of a square as a biconditional.

Is this biconditional true?

It's July if and only if it's Summer time.

Write the two conditionals that make up this biconditional

Congruent figures have the same shape.

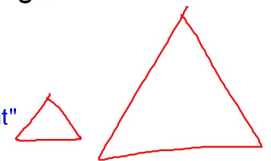
1. Write this statement as a biconditional

They're \cong fig iff they have the same shape

2. Is this a good definition of Congruent Figures?
Is the biconditional true?

No, the conditional:

"If figures have the same shape, then they are congruent"



is not true: They could be similar which means one figure is larger than the other but still have the same shape.