

Write the inverse of each conditional statement. Determine if the inverse is true or false. If false provide a counterexample.

If a polygon is a quadrilateral, then it has four sides.

If a polygon is *Not* a quadrilateral, then it does *NOT* have *four sides*

If two lines are parallel, then the lines do not intersect.

If two lines are *NOT* parallel, then the lines intersect.

Write the contrapositive of the conditional statement. Determine if the contrapositive is true or false. If false provide a counterexample.

If two whole numbers are both even, then their sum is even.

Inverse If 2 whole numbers are not both even, then their sum is
Not even.

Contrapositive

If the sum of 2 whole numbers is not even, then both the numbers are not even.

Write the contrapositive of the conditional statement. Determine if the contrapositive is true or false. If false provide a counterexample.

If today is a weekend day, then tomorrow is Monday.

If tomorrow is NOT Monday, then Today is Not a weekend day.

All squares are rhomi.

Write the above sentence as a conditional statement. Then write converse, inverse, and contrapositive of the conditional statement.

If a figure is a square, then it is a Rhombus.

If a figure is a Rhombus, then it is a square

If a figure is not a square, then it is not a Rhombus

If a figure is not a Rhombus, then it is not a square

Students that study do well in school.

Write the above sentence as a conditional statement. Then write converse, inverse, and contrapositive of the conditional statement.

If a student studies, then they will do well in school.

Biconditional Statements

A **biconditional** is the combination of a conditional, $p \rightarrow q$, and its converse, $q \rightarrow p$. The resulting compound statement $p \leftrightarrow q$ is read as " p if and only if q ."

Write the sentence as a conditional statement. Write the converse of the conditional statement. If both are true write the biconditional statement.

The fourth of July is Independence Day.

If it's the 4th of July, then it's Independence Day.

If it's Independence Day, then it's the 4th of July

It's the 4th of July IF and ONLY IF it's
Independence Day

Write the sentence as a conditional statement. Write the converse of the conditional statement. If both are true write the biconditional statement.

Perpendicular lines intersect to form right angles.

Lines are perpendicular if and only if they intersect to form
Right Angles.

What are the two conditionals that implied by the biconditional?

A triangle is equilateral if and only if it has 3 congruent sides.

What are the two conditionals that implied by the biconditional?

The product of two numbers is negative if and only if the numbers have opposite signs.