Honors Geometry
Section 2.3 Notes
Biconditionals and Definitions

Name: Key

Key Definitions:

1. A biconditional is a single true statement that combines a true conditional and its true converse. They are written using the phrase *if and only if*.

$p \leftrightarrow q$

Practice Problems

Each conditional statement below is true. Write its converse. If the converse is also true, combine the statements as a biconditional.

1. If a number is divisible by 2, then the number is even.

CONVERSE: If the number is even, then it is divisible by 2.

BICONDITIONAL: A number is divisible by 2, if and only if the number is even.

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

CONVERSE: If 2 angles are congruent, then they have the same measure.

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

3. If a closed figure is a pentagon, then it has exactly five sides.

CONVERSE: If a figure has exactly five sides, then it is a pentagon.

BICONDITIONAL: A figure is a pentagon, if and only if it has five sides.

4. If two numbers are both even, then the sum of the two numbers is even.

CONVERSE: If the sum of two numbers is even, then both numbers are even.

Write the two statements that form each biconditional.

1. Two lines are perpendicular if and only if they intersect to form four right angles.

1. If 2 lines are perpendicular, then they form right angles.
2. If 2 lines form right angles, then they are perpendicular.

2. A whole number is divisible by 3 if and only if the sum of the digits of the whole number is divisible by 3.

1. If a whole number is divisible by 3, then the sum of the digits is divisible by 3.
2. If the sum of the digits is divisible by 3, then the number is divisible by 3.

3. A whole number is an odd number if and only if it is not divisible by 2.

4. A person lives in Alaska if and only if the person lives in the northernmost state in the United States.

Test each statement below to see if it is reversible. If so, write it as a true biconditional. If not, write *not reversible.*

1. If a quadrilateral is a square, then the quadrilateral has four congruent angles.

If a quadrilateral has 4 congruent angles, then it is a square.

NOT REVERSIBLE

2. A circle is a figure with no sides.

If a figure has no sides, then it is a circle.

NOT REVERSIBLE

3. If a quadrilateral is a trapezoid, it has exactly two sides that are parallel.

If a figure has exactly 2 sides that are parallel, then it is a trapezoid.

* A quadrilateral is a trapezoid if and only if it has exactly 2 parallel sides.

4. A person who lives in Miami is a person who lives in Florida.

If a person lives in Florida, then they live in Miami.

NOT REVERSIBLE

Is each statement below a good definition? If not, explain.

1. A redwood tree is an evergreen tree that grows very tall.

NO, NOT REVERSIBLE

2. A hexagon is a polygon with exactly six sides.

YES