

Geometry Worksheet: Using logical reasoning

From prentice hall geometry book, 4.1 pg 185

Write the converse, the inverse, and the contrapositive of the following conditionals

1. If you eat all of your vegetables, then you will grow.

Converse:

Inverse:

Contrapositive:

2. If you do not work, then you will not get paid.

Converse:

Inverse:

Contrapositive:

Label each statement as converse, inverse, contrapositive (or none) of the given conditional.

3. If a triangle is a right triangle, then it has a ninety degree angle.

A. _____ If a triangle has a ninety degree angle, then it is a right triangle.

B. _____ If a triangle is not a right triangle, then it does not have a ninety degree angle.

C. _____ If a triangle does not have a ninety degree angle, then it is not a right triangle.

4. If two segments are congruent, then they have the same length.

A. _____ If two segments do not have the same length, then they are not congruent.

B. _____ If two segments are not congruent, then they have the same length.

C. _____ If two segments have the same length, then they are congruent.

5. If a quadrilateral has exactly two congruent sides, then it is not a rhombus.

A. _____ If a quadrilateral does not have exactly two congruent sides, then it is a rhombus.

B. _____ If a quadrilateral is not a rhombus, then it has exactly two congruent sides.

C. _____ If a quadrilateral is a rhombus, then it has exactly two congruent sides.

6. If you do not do your homework, then you will fail geometry.

A. _____ If you don't fail geometry, then you do your homework.

B. _____ If you fail geometry, then you do not do your homework.

C. _____ You fail geometry if and only if you do not do your homework.

Explain a counter-example to show that each statement is not always true.

Example: "If it is not a weekday, then it is Saturday." --Sunday is also not a weekday, so it is false.

7. Odd integers less than 10 are prime.

8. If you live in a country that borders the United States, then you live in Canada.

9. If you play a sport with a ball and bat, then you play baseball.

Re-write the biconditional as two statements. (a conditional and its converse.)

10. A swimmer wins a race if and only if she swims the fastest.

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

(a) Find the truth value of each statement. (Is it true or false?) (b) Then write the converse and find its truth value. (c) If both statements are true, write it as a biconditional using the phrase "if and only if."

12. If you are in Indiana, then you are in Indianapolis.

(a)

(b)

(c)

13. If a shape is a triangle, then it has three sides.

(a)

(b)

(c)

Re-write each statement in if/then form. For example: "You should say what you mean" could be written as "If you mean something, then you should say it."

14. Glass objects are fragile.

15. An isosceles triangle has two congruent sides.

Advertisers often suggest that if you buy something, then something good will happen. Look through a magazine. Find 3 advertisements and write down the main message of the ad, word for word. Then, rewrite that message as an if/then statement. *For extra credit, make a poster or PowerPoint to display this same process with 5 or more ads.*