

## Geometry 22 - More Practice for Chapter 2 Test

### 2-2 Conditional Statements

1. What is the hypothesis of the given statement?

If pigs had wings, you could fly.

- A Pigs have wings.  C Pigs do not have wings.  
 B You can fly.  D You cannot fly.

2. Which statement is the converse of the given statement?

If you make an insurance claim, then your rates will go up.

- F If your insurance rates do not go up, then you have not made a claim.  
 G If you do not make an insurance claim, then your rates will not go up.  
 H If your insurance rates go up, then you have made an insurance claim.  
 I If you make an insurance claim, then your rates will not go up.

3. Which statement is the contrapositive of the given statement?

If a person is a banjo player, then the person is a musician.

- A If a person is not a musician, then the person is not a banjo player.  
 B If a person is not a banjo player, then the person is a musician.  
 C If a person is not a banjo player, then the person is not a musician.  
 D If a person is a musician, then the person is a banjo player.

4. How are the two statements given below related to each other?

X: If you run for 10 minutes, then you will raise your heart rate.

Z: If you do not run for 10 minutes, then you will not raise your heart rate.

- F Z is the contrapositive of X.  H Z is the inverse of X.  
 G Z is the converse of X.  I Z is the retrograde of X.

5. What are the inverse and the contrapositive of the following conditional?

If a movie is a comedy, then it is funny.

inverse: If a movie is NOT a comedy, then it is NOT funny.

contrapositive: If the movie is NOT funny, then it is NOT a comedy.

6. Identify the hypothesis and conclusion of the following conditional:

If Lexi is nearsighted, then Lexi needs glasses.

Hyp: Lexi is nearsighted

Conclusion: Lexi needs glasses

7. Write the following statement as a conditional ("if-then"). Then write the converse, inverse, and contrapositive. Determine whether each statement is TRUE or FALSE.

The product of two even numbers is even. IF it is the product of 2 even numbers, then it is even.

converse: If it is even, then it is the prod. of 2 even #'s, even

inverse: If it is NOT a product of 2 even #'s, then it is NOT a product of 2 even #'s.

contrapositive: If it is not even, then it is not the prod. of 2 even #'s

## 2-3 Biconditionals and Definitions

1. Which statement is a good definition of a rectangle?

- A A rectangle is a shape with four sides.
- B A rectangle is a shape with two pairs of parallel sides.
- C A rectangle is a quadrilateral with four congruent angles.
- D A rectangle is a parallelogram with four congruent sides.

2. Conditional: If a triangle is scalene, then the triangle has no congruent sides.

Which statement shows the conditional written as a true biconditional?

- A A triangle is scalene if and only if it has no congruent sides.
- C If a triangle has no congruent sides, then the triangle is scalene.
- H If a triangle has some congruent sides, then the triangle is not scalene.
- I A triangle is equilateral if and only if it is not scalene.

3. Biconditional: A triangle is equilateral if and only if the triangle has three congruent angles.

Which choice shows the two conditionals that make up the biconditional?

- A If a triangle has three sides, then it is equilateral. If the triangle is equilateral, then it has three sides.
- B If a triangle is equilateral, then it has three congruent angles. If a triangle has three congruent angles, then it is equilateral.
- C If a triangle is scalene, then the triangle is not equilateral. If a triangle is equilateral, then the triangle is not scalene.
- D An equilateral triangle has symmetry. If a triangle has symmetry, it is equilateral.

4. Write this definition as a true biconditional two different ways.

Definition: A rhombus is a parallelogram with four congruent sides.

~~IF IS~~ A rhombus is a parallelogram

5. Write the conditional form of the following statement and then the converse of the conditional. If the converse is true, combine the statements as a biconditional.

*Rectangles are quadrilaterals with four right angles.*

## 2-5 Reasoning in Algebra and Geometry

### Concept List

Addition Property of Equality	Distributive Property
Division Property of Equality	Multiplication Property of Equality
Reflexive Property of Equality	Substitution Property
Subtraction Property of Equality	Symmetric Property of Equality
Transitive Property of Equality	

A. Choose the concept from the list above that best represents the item in each box.

<p>1. If <math>a = b</math>, then <math>a + c = b + c</math></p> <p><i>addition</i></p>	<p>2. If <math>a = b</math>, and <math>c \neq 0</math>, then <math>\frac{a}{c} = \frac{b}{c}</math></p> <p><i>Division</i></p>	<p>3. <math>12.5 = 12.5</math></p> <p><i>Reflexive</i></p>
<p>4. If <math>a = b</math>, and <math>b = c</math>, then <math>a = c</math></p> <p><i>Transitive</i></p>	<p>5. If <math>a = b</math>, then <math>b = a</math></p> <p><i>Symmetric</i></p>	<p>6. If <math>a = b</math>, then <math>a \cdot c = b \cdot c</math></p> <p><i>multiplication</i></p>
<p>7. <math>3(12 - 4)</math> <math>= (3)(12) - (3)(4)</math></p> <p><i>Distributive</i></p>	<p>8. If <math>a = b</math>, then <math>a - c = b - c</math></p> <p><i>Subtraction</i></p>	<p>9. <math>a = -4</math> <math>6a + 2 = 6(-4) + 2</math></p> <p><i>Substitution</i></p>

B. 1. According to the Transitive Property of Equality, if  $TX = XY$ , and  $XY = YZ$ , then  $TX = \square$ .

(A)  $TX$

(B)  $XY$

(C)  $YZ$

(D)  $TZ$

2. What property is illustrated by the statement, if  $KL = LM$ , then  $LM = KL$ ?

(F) Reflexive Property of Equality

(H) Transitive Property of Equality

(G) Symmetric Property of Equality

(I) Division Property of Equality

Use the list of reasons below for Exercises 3-6. Choose the correct reason for each algebraic statement.

(A) Subtraction Property of Equality

(C) Distributive Property

(B) Combine like terms.

(D) Division Property of Equality

Statements	Reasons
$3(x + 2) + 1 = 8$	Given
$6x + 6 + 1 = 8$	3) ? Distributive (C)
$6x + 7 = 8$	4) ? Combine Like terms (B) (or simplify)
$6x = 1$	5) ? Subtraction (A)
$x = \frac{1}{6}$	6) ? Division (D)

Use the figure at the right for Exercises 4 and 5.

4. What is the value of  $x$ ?

(F) 8.9

(H) 16.8

(G) 22.5

(I) 27.5

5. What is the value of  $y$ ?

(A) -10

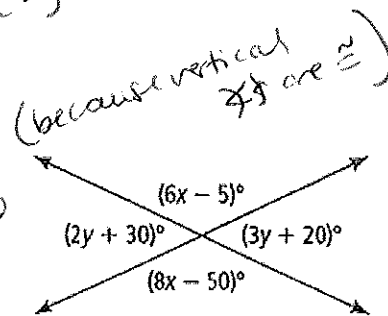
(C) 2

(B) -2

(D) 10

$$6x - 5 = 8x - 50$$

$$45 = 2x$$



$$2y + 30 = 3y + 20$$

$$10 = y$$

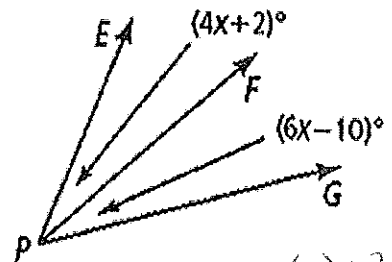
8. Solve for  $x$ . Show your work. Justify each step.

Given:  $\overline{PF}$  bisects  $\angle EPG$

$$4x + 2 = 6x - 10$$

$$12 = 2x$$

$$x = 6$$



So  $m\angle EPF = 4(6) + 2 = 26^\circ$   
 $m\angle FPG = 6(6) - 10 = 26^\circ$

9. Name the property of equality or congruence that justifies going from the first statement to the second statement.

a.  $\angle M \cong \angle N$

$\angle N \cong \angle M$

Symmetric

b.  $3x = 24$

$x = 8$

Division

c.  $\overline{PQ} \cong \overline{RS}$  and  $\overline{RS} \cong \overline{TU}$

$\overline{PQ} \cong \overline{TU}$

Transitive