## **Concepts and Vocabulary**

Three Types of Transformations: Translations, Rotations, and Reflections.

**Congruent Figures (isometric figures)** have the same size and shape. Translations, rotations, and reflections create figures that are congruent.

## **Practice Questions**

- 1) The vertices of a rectangle are R (2, 4), S (5, -1), T (-7, 7), and U (-4, 6). After a translation, R' is the point (3, -1). Write the translation rule and the coordinates of U'.
- A)  $(x,y) \rightarrow (x + 1, y 5); (-3, 1)$ C)  $(x,y) \rightarrow (x + 1, y + 5); (-3, 1)$ D)  $(x,y) \rightarrow (x - 1, y - 5); (-3, 1)$

2) Write a rule to describe the transformation that is a reflection in the y-axis.

A)  $(x, y) \rightarrow (-x, -y)$  B)  $(x, y) \rightarrow (y, x)$  C)  $(x, y) \rightarrow (-x, y)$  D)  $(x, y) \rightarrow (x, -y)$ 

3) Which rules describe the translation that is 5 units to the right and 3 units up?

A)  $(x,y) \rightarrow (x +5, y -3)$ B)  $(x,y) \rightarrow (x -5, y -3)$ C)  $(x,y) \rightarrow (x -5, y + 3)$ D)  $(x,y) \rightarrow (x + 5, y + 3)$ 

4) Sammy plots the point (10, 3) on a coordinate grid. He reflects this point over the x-axis, then over the y-axis. What are the coordinates of the image point after both reflections?
A) (-10, 3)
B) (-3, 10)
C) (-10, -3)
D) (10, -3)

5) What would be the coordinates of the images of points A,B,C, and D from the trapezoid below after a reflection over the line y = -x?



6) If a point F(7, -6) is translated according to the rule  $(x, y) \rightarrow (x + 3, y - 2)$ , find the coordinates of F'.

Name:

7) Solve the system algebraically.

$$6x - 8y = 50$$
$$4x + 6y = 22$$

- 8) Describe parallel lines.
- 9) Describe perpendicular lines.
- 10) Given a 12-sided regular polygon:
  - a. How many lines of symmetry does it have?
  - b. List ALL angles of rotation to map the figure onto itself.

## For #'s 11 – 16, write the coordinates of the image and the algebraic rule.

11) rotation  $180^{\circ}$  about the origin



13) translation: 6 units right and 1 unit up



12) reflection across y = x

 $\hat{x}$ 

14) reflection across the y-axis





For #'s 17 - 20, verbally describe the transformation. Be specific!









W'

W