NAME_____

Test Review: Transformational Geometry

1. Which of the following words means the same size and same shape?
   a. Similar b. compare c. congruent d. translate

2. Describe in words each of our rules for:
   a. Rotating 90° counterclockwise
   Switch the x & y coordinates and change the y to its opposite sign
   $(x,y) \rightarrow (-y,x)$
   b. Reflecting over the x-axis.
   Keep the x the same and change y to its opposite sign $(x,y) \rightarrow (x,-y)$
   c. Translating right 3 and then down 2.
   add three to the x cooridinate and subtract two from the y.
   $(x,y) \rightarrow (x+3, y-2)$

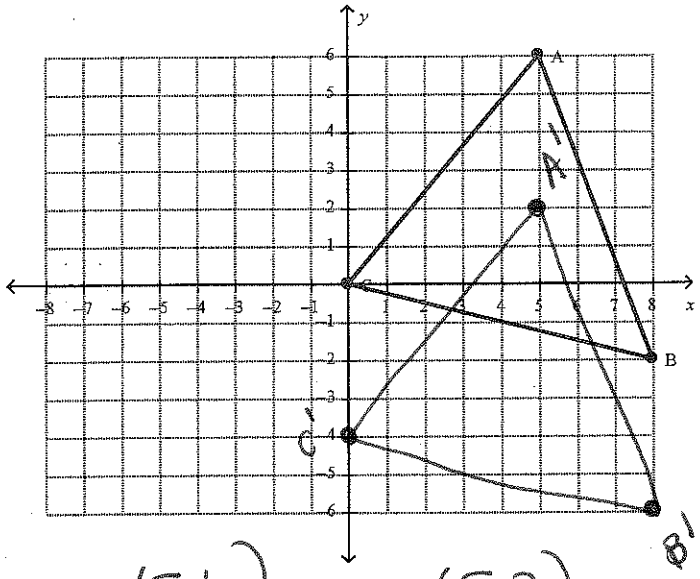
3. The police use maps to track their patrol cars. One police car radioed in their position to be (15, 21). One hour later they were at a location of (-10, 16).
   a. Describe the translation in words.
   They went left (west) 25 and down (south) five.
   b. Describe the translation using symbols.
   $(x,y) \rightarrow (x-25, y-5)$

4. When you rotate a figure it gets bigger. TRUE or FALSE
   Justify:

5. Explain the difference between a "pre-image" and an "image".
   The pre-image is the first figure & the image is the figure after the transformation.

6. Complete the following transformations for each shape, by completing the following...
   - Identify the pre-image coordinates.
   - Find the image coordinates.
   - Draw the new shape and label the vertices. (A' or x'...)

a. Translate 4 DOWN.



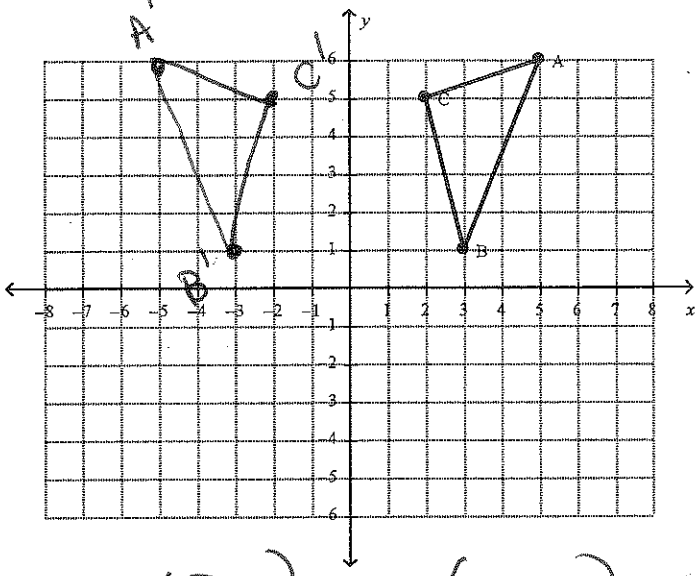
A (5,6) A' (5,2)

B (8,-2) B' (8,-6)

C (0,0) C' (0,-4)

Rule: (x,y) → (x, y-4)

B. Reflect over the y-axis.



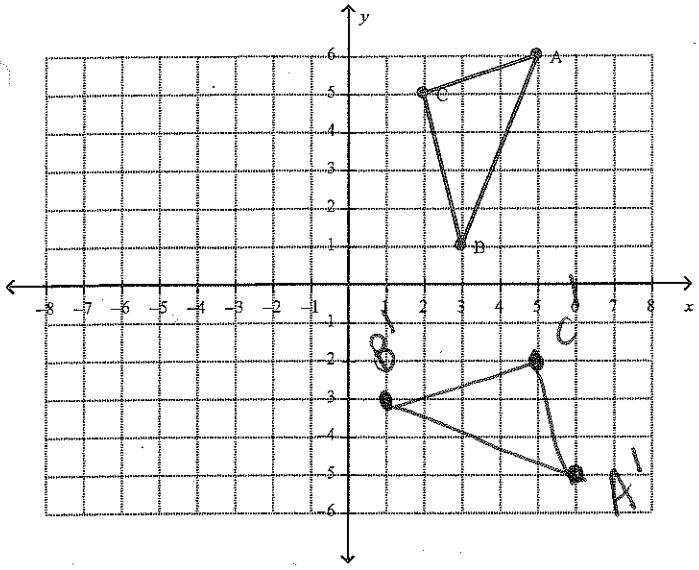
A (5,6) A' (-5,6)

B (3,1) B' (-3,1)

C (2,5) C' (-2,5)

Rule: (x,y) → (-x,y)

c. Rotate 270 degrees counterclockwise



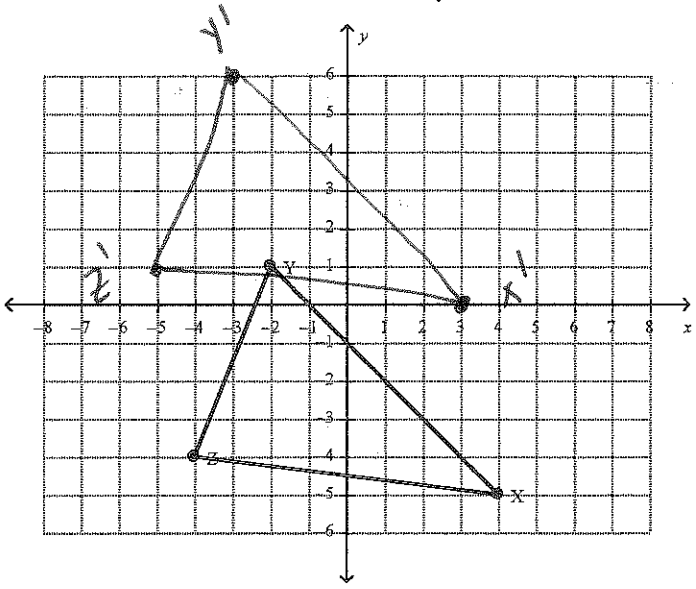
A (5,6) A' (6,-5)

B (3,1) B' (1,-3)

C (2,5) C' (5,-2)

Rule: (x,y) → (y,-x)

d. Translate 1 left and 5 up



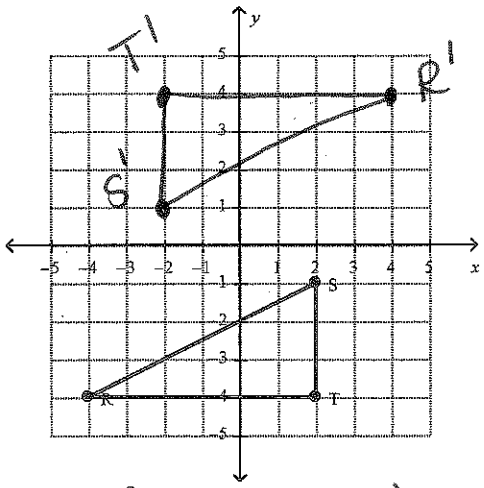
X (4,-5) X' (3,0)

Y (-2,1) Y' (-3,6)

Z (-4,-4) Z' (-5,1)

Rule: (x,y) → (x-1, y+5)

a. Rotate 180° counterclockwise



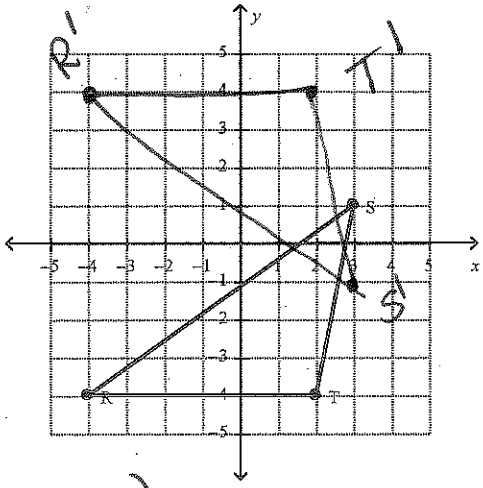
R (-4,-4) R' (4,4)

S (2,-1) S' (-2,1)

T (2,-4) T' (-2,4)

Rule: (x,y) → (-x,-y)

f. Reflect over the x-axis



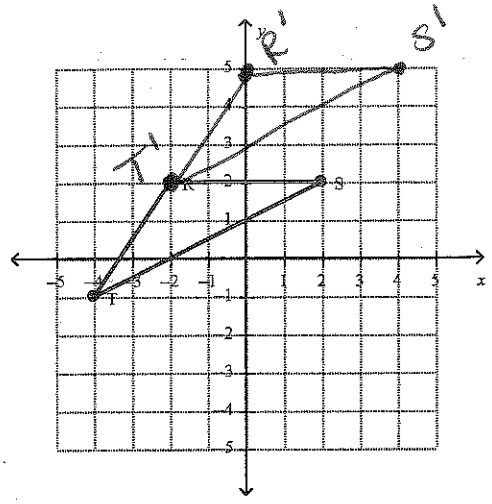
R (-4,-4) R' (-4,4)

S (3,1) S' (3,-1)

T (2,-4) T' (2,4)

Rule: (x,y) → (x,-y)

g. Translate 2 right and 3 up



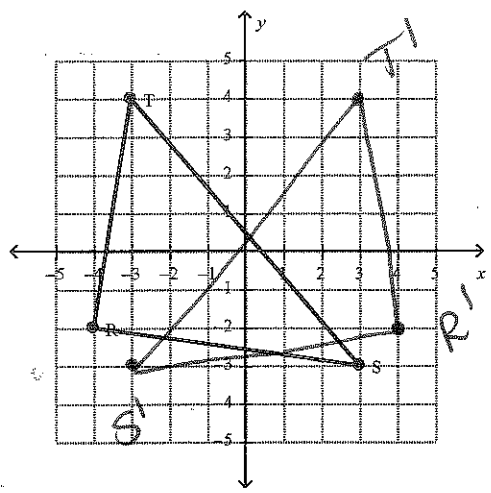
R (-2,2) R' (0,5)

S (2,2) S' (4,5)

T (-4,-1) T' (-2,2)

Rule: (x,y) → (x+2, y+3)

h. Reflect over the y-axis.



R (-4,-2) R' (4,-2)

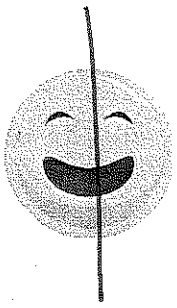
S (3,-3) S' (-3,-3)

T (-3,4) T' (3,4)

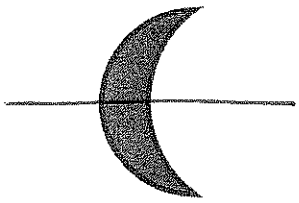
Rule: (x,y) → (-x,y)

7. Draw all lines of symmetry for the following figures.

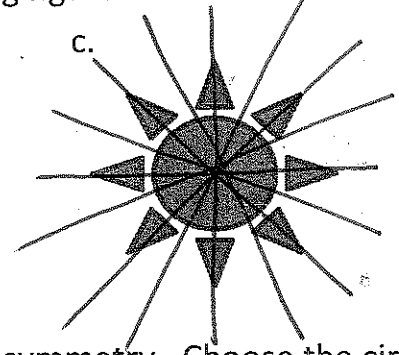
a.



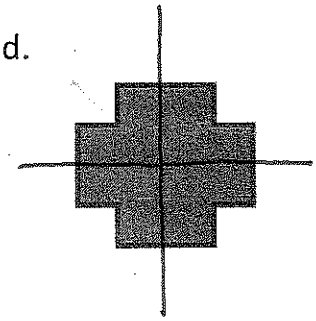
b.



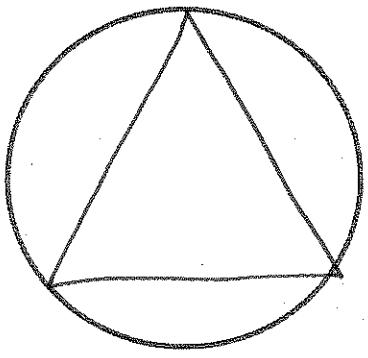
c.

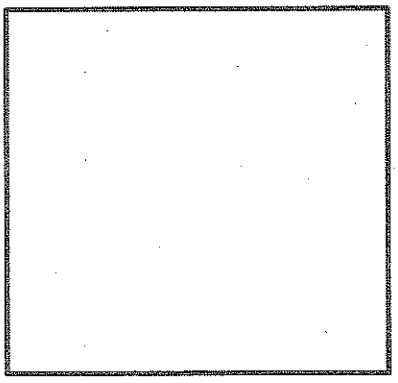


d.



8. Create a design that will have reflectional symmetry. Choose the circle or the square to make your design.





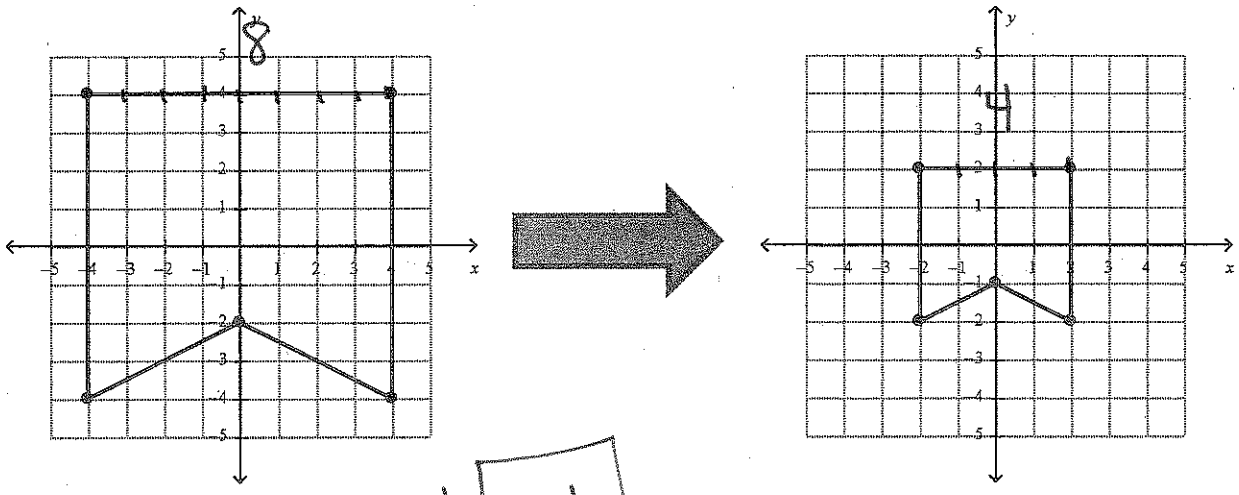
9. For each of the following pairs of points, identify the transformation. Was it a rotation (how much), was it a reflection (over which line), was it a translation (which way and how much)?

	Pre-Image	Image	Transformation
a.	(6,8)	(8, -6)	Rotation 270° counterclockwise
b.	(-20, -3)	(-25, 0)	Translate left 5 and up 3.
c.	(-7, 100)	(-100, -7)	Rotate 90° counterclockwise
d.	(3, -12)	(3, 12)	Reflect over the x-axis
e.	(0,0)	(-6, 15)	Translate 6 left & 15 up
f.	(14, -62)	(62, 14)	Rotate 90° counterclockwise

10. Fill in the missing image points.

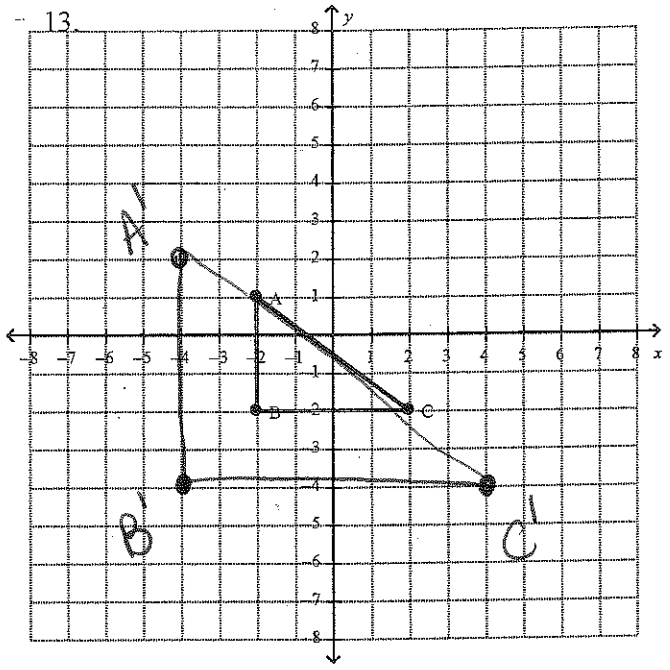
	Pre-Image	Transformation	Image
a.	(6,8)	Translate right 7 and down 12	(13, -4)
b.	(-20, -3)	Rotate 270° counterclockwise	(-3, 20)
c.	(-7, 100)	Reflection over the x-axis.	(-7, -100)
d.	(3, -12)	Rotate 180° counterclockwise	(-3, 12)
e.	(0,0)	Translate 4 left.	(-4, 0)
f.	(14, -62)	Reflection over the y-axis.	(-14, -62)

11. Find the scale factor of the dilation pictured below.



$\frac{4}{8} = \frac{1}{2}$

12. Consider the pre-image on the graph and the information below. Draw in the image and fill in the pre-image and the image coordinates.



Center of Dilation (0, 0)

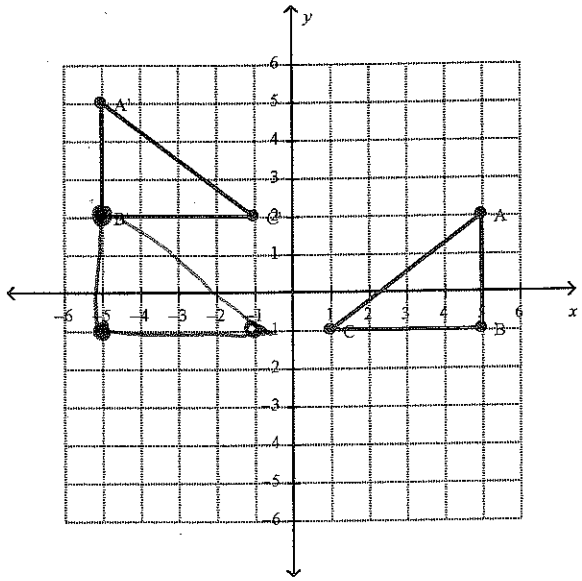
Scale Factor = 2

Pre-Image	Image
A (-2, 1)	A' (-4, 2)
B (-2, -2)	B' (-4, -4)
C (2, -2)	C' (4, -4)

Rule: $(x, y) \rightarrow (2x, 2y)$

14. Describe the sequence of transformations illustrated in each graph below.

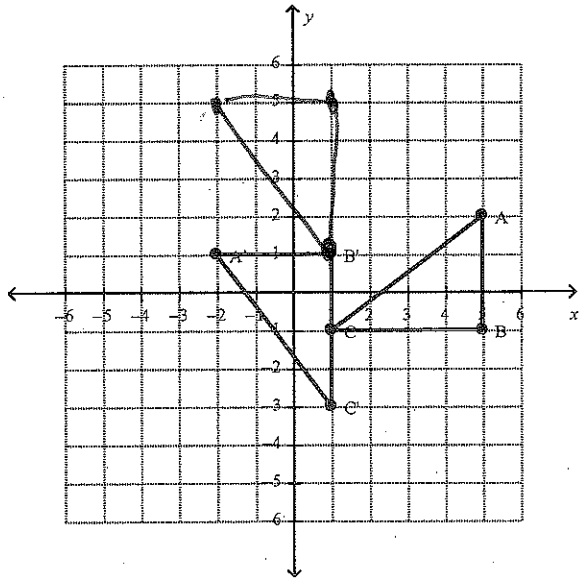
a.



1) Reflect over the y-axis

2) Translate up 3 units

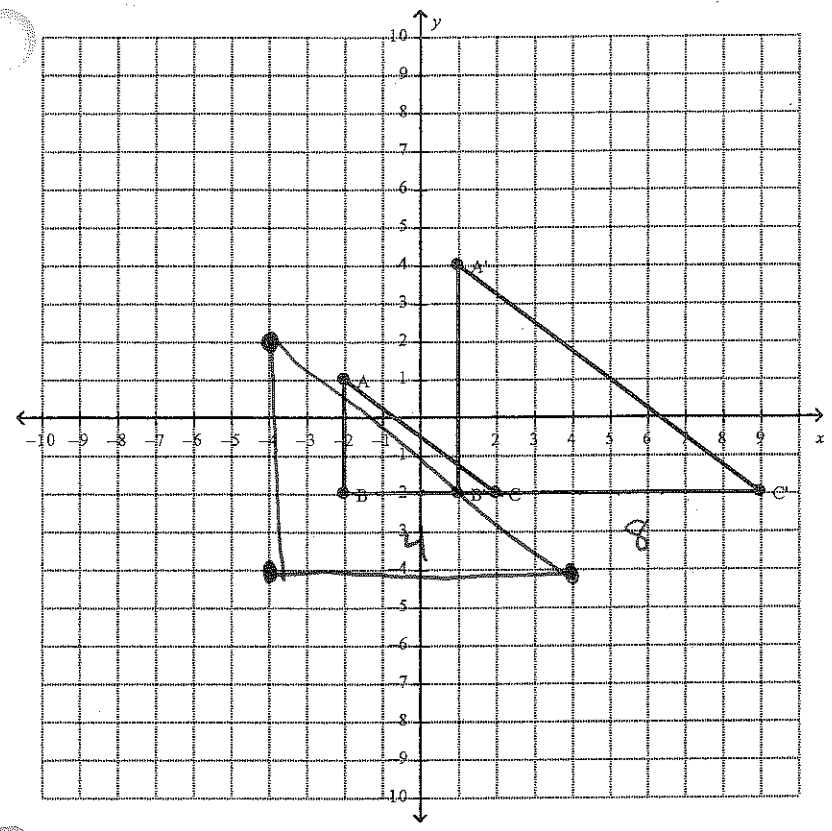
b.



1) Rotate 90° counterclockwise

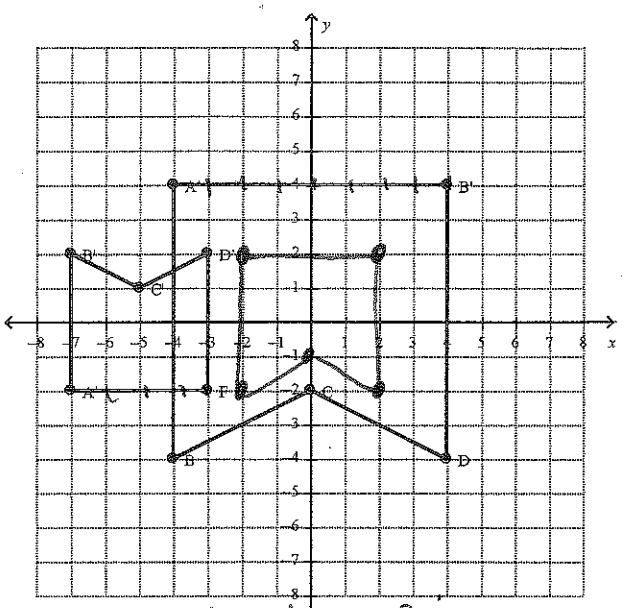
2) Translate down 4 units

c.



1) Dilate by a scalefactor of 2
2) Translate right 5 and up 2

d.



(use the large figure as the pre-image)

1) Dilate by a scalefactor of 1/2
2) Rotate 180°
3) Translate left 5 units