Transformations Test Review

Name: _____

Accelerated 7th Grade Math

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

2. 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.

   left (west) 25 and down (south) 5

   b. Describe the translation using symbols.

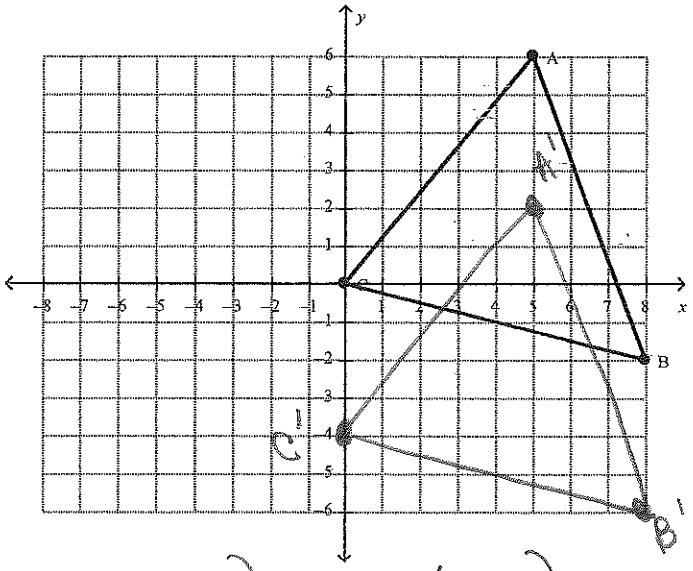
   $(x, y) \rightarrow (x-25, y-5)$

3. Explain the difference between a "pre-image" and an "image".

   The pre-image is the original coordinate & the image is the new coordinate.

4. 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.



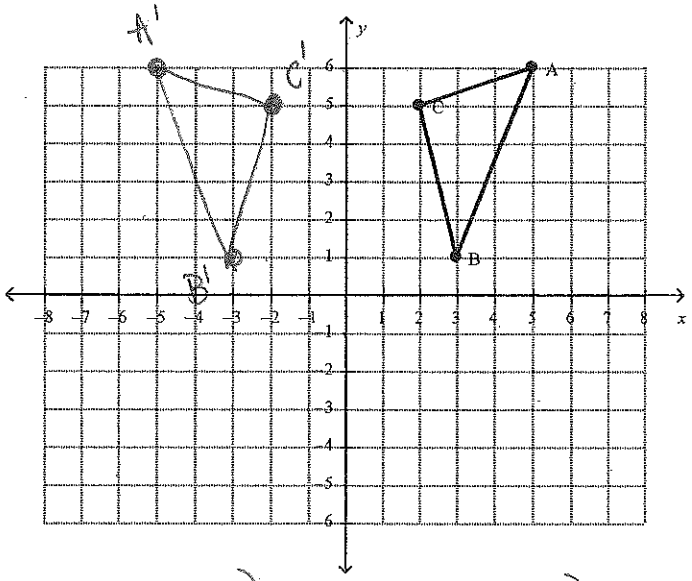
A (5,6) A' (5,2)

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

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

Rule: $(x, y) \rightarrow (x, y-4)$

   b. Reflect over the y-axis.



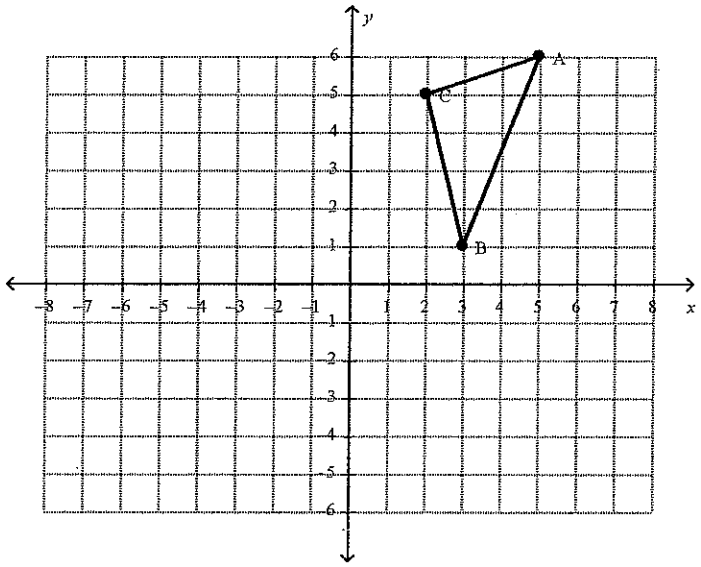
A (5,6) A' (-5,6)

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

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

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

c. Rotate 270 degrees counterclockwise



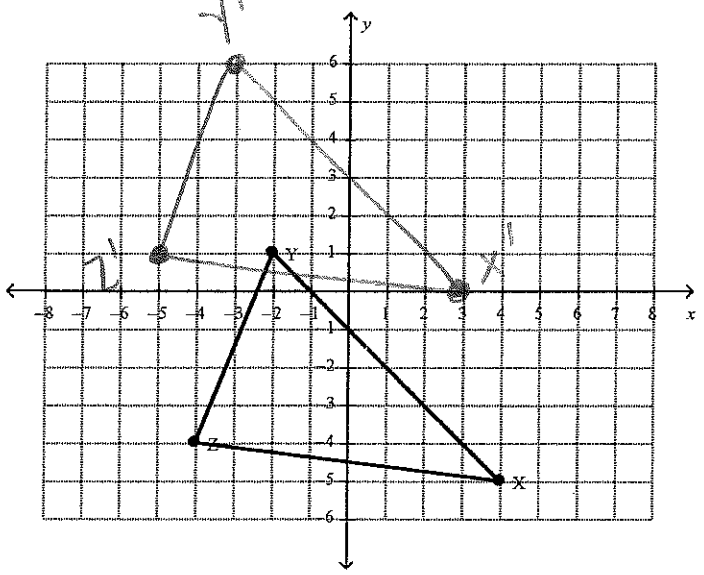
A (5,6) A' (6,-5)

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

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

Rule: (x,y) → (y,-x)

d. Translate 1 left and 5 up



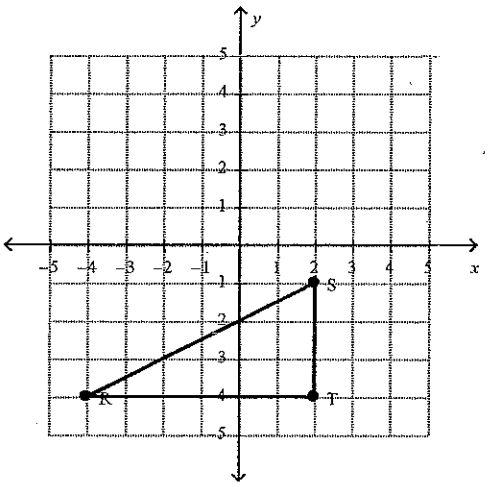
X (4,-5) X' (3,0)

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

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

Rule: (x,y) (x-1, y+5)

e. Rotate 180°



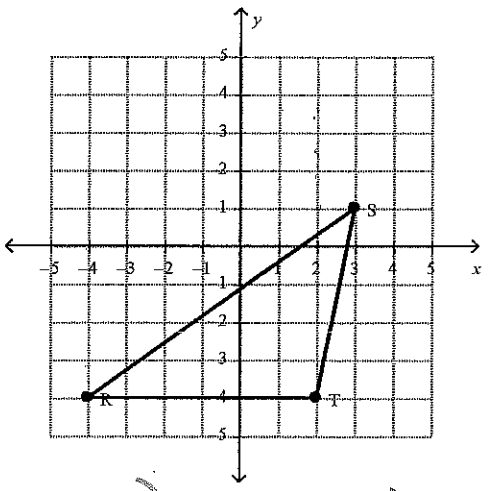
R (-4,-4) R' (4,4)

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

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

Rule: (x,y) → (-x,-y)

f. Reflect over the x-axis



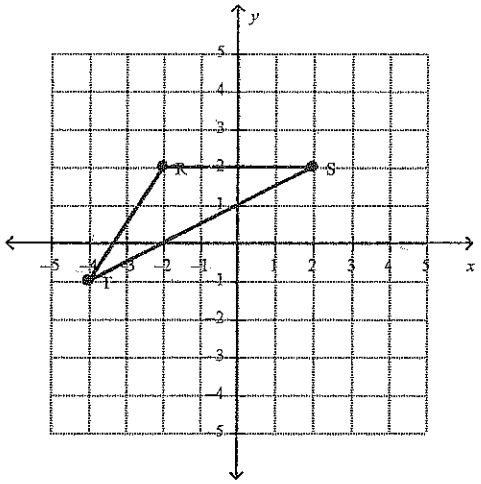
R (-4,-4) R' (-4,4)

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

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

Rule: (x,y) → (x,-y)

g. Translate 3 up and 2 right



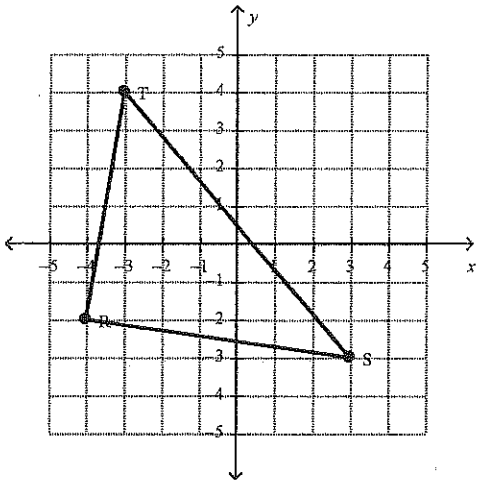
R (-2, 2) R' (0, 5)

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' (3, 4)

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

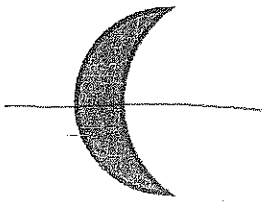
T (-3, 4) T' (3, 4)

Rule: (x, y) → (-x, y)

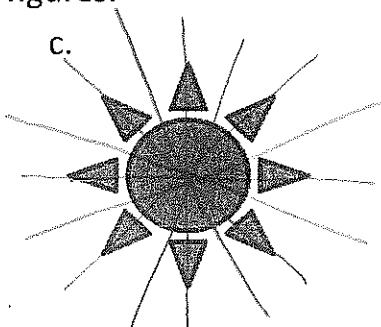
5. Draw all lines of symmetry for the following figures.

a.

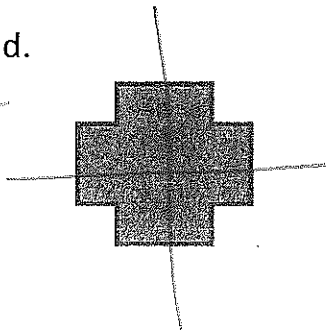
b.



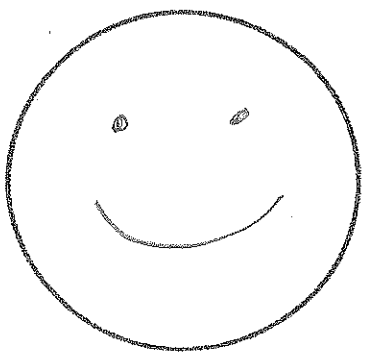
c.

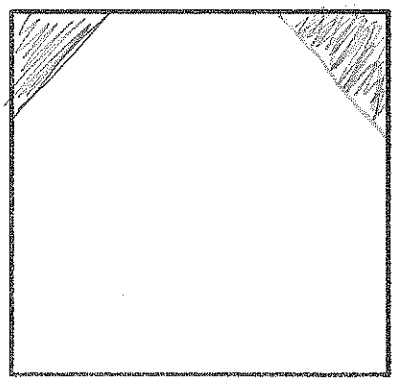


d.



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





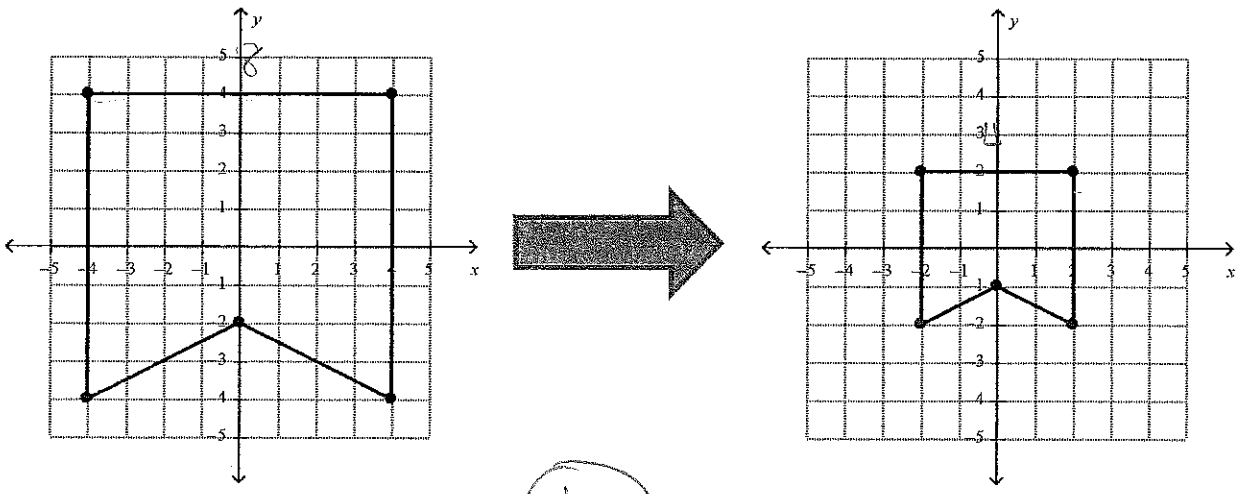
7. For each of the following pairs of points, identify the transformation. Was it a rotation (how much), was it a reflection (over which line), was it a translation (which way and how much)?

	Pre-Image	Image	Transformation
a.	(6,8)	(8, -6)	Rotate 270° counterclockwise
b.	(-20, -3)	(-25, 0)	Translate left 5 + 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 left 6 and up 15
f.	(14, -62)	(62, 14)	Rotate 90° counterclockwise

8. Fill in the missing image points.

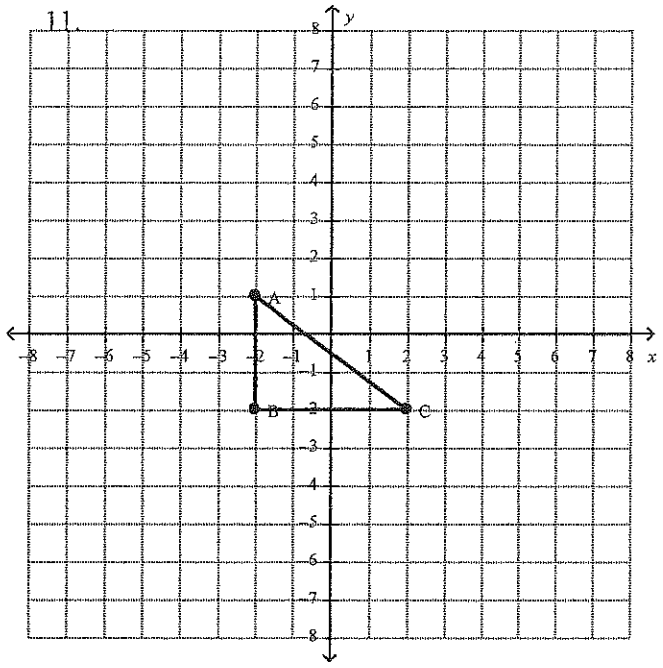
	Pre-Image	Transformation	Image
a.	(6,8)	Translate right 7 and down 12	(13, -4)
b.	(-20, -3)	Rotate 270°	(-3, 20)
c.	(-7, 100)	Reflection over the x-axis.	(-7, -100)
d.	(3, -12)	Rotate 180°	(-3, 12)
e.	(0,0)	Translate 4 left.	(-4, 0)
f.	(14, -62)	Reflection over the y-axis.	(-14, -62)

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



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

10. 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)

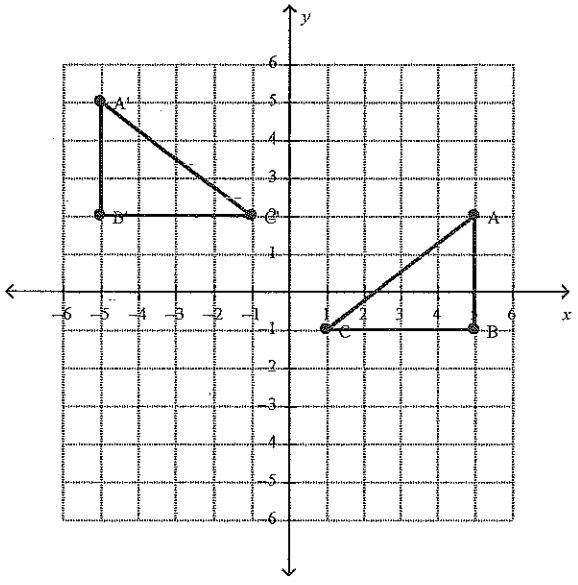
Scale Factor = 2

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

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

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

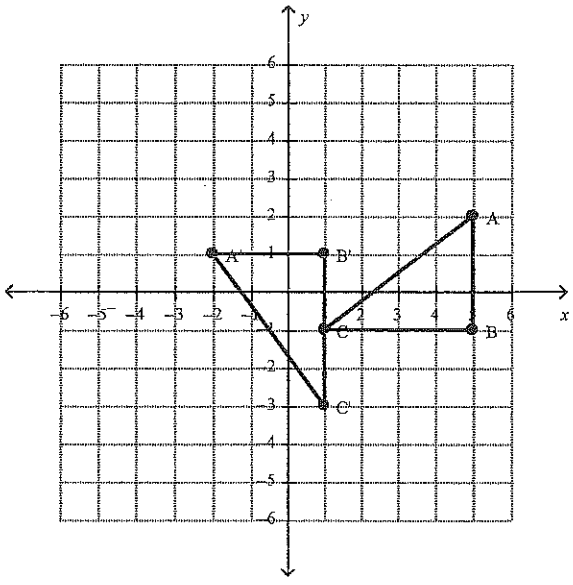
a.



1) reflect over the y-axis

2) translate up 3

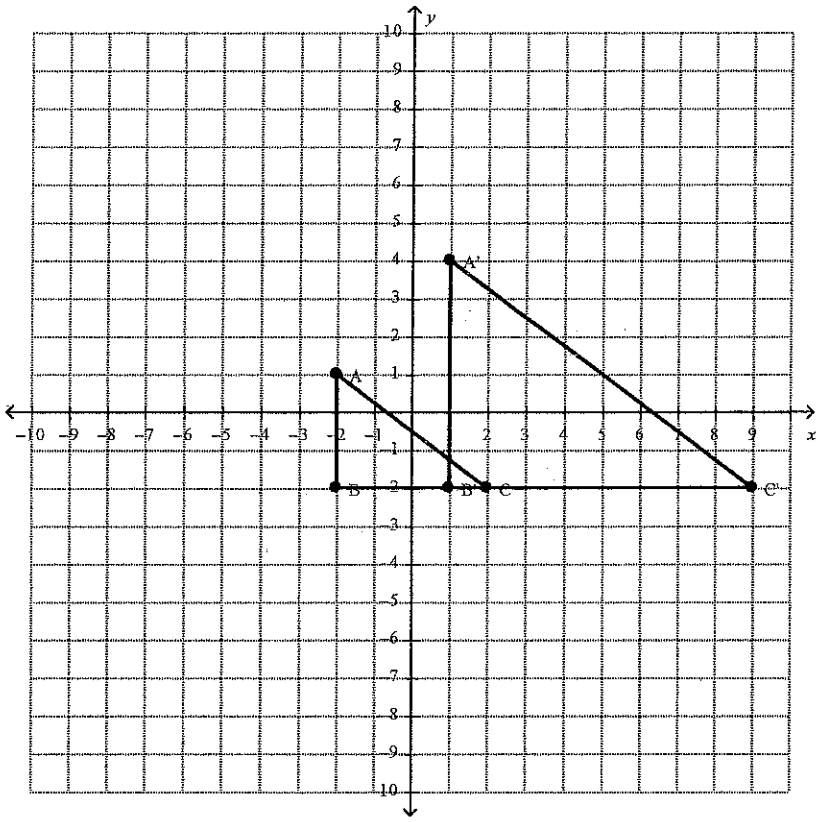
b.



1) Rotate 90° counterclockwise

2) Translate down 4

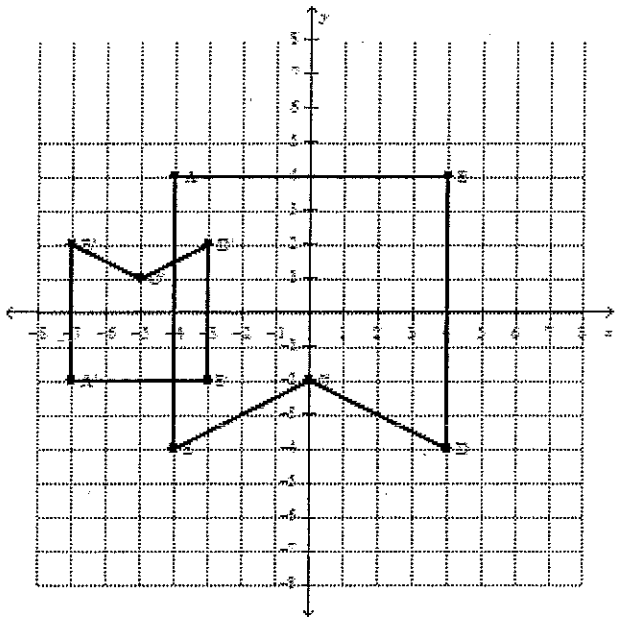
c.



1) Dilate by a scale factor of 2

2) Translate right 5 & up 2

d.



1) Rotate 180°

2) Dilate by a scale factor of $\frac{1}{2}$

3) Translate left 5

Answers:

1) c

2) a. left 25, down 5
   b. (x – 25, y – 5)

3) -

4) a. (x, y – 4)
   b. (–x, y)
   c. (y, –x)
   d. (x – 1, y + 5)
   e. (–x, –y)
   f. (x, –y)
   g. (x + 2, y + 3)
   h. (–x, y)

5) -

6) -

7) a. rotate 270
   b. translate (x – 5, y + 3)
   c. rotate 90
   d. reflect x-axis
   e. translate (x – 6, y + 15)
   f. rotate 90

8) a. 13, –4
   b. –3, 20
   c. –7, –100
   d. –3, 12
   e. –4, 0
   f. –14, –62

9) ½

10) (2x, 2y)

11) a. reflect y-axis, trans (x, y + 3)
   b. rotate 90, trans (x, y – 4)
   c. dilate (2x, 2y), trans (x + 5, y + 2)
   d. reflect x-axis, dilate (0.5x, 0.5y), trans (x – 5, y)