

Name: Key

Date: _____

Geometry Vocabulary Practice

MCC9-12.G.CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc

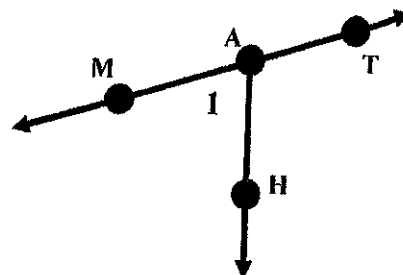
Practice Problems:

1. Name an example of each of the following:

Line Segment: MA

A Line: MA

A Ray: AM



2. Name the angle represented with the number 1 using 3 letters.

$\angle MAH$
 $\angle HAM$

Is this angle an obtuse, acute, or right angle? acute

3. Which geometric object is suggested by a car's headlights?

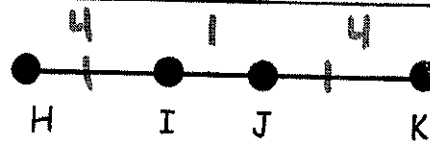
a. Line

b. point

c. ray

d. segment

If $HK = 9$, $HI = JK$, AND $IJ = 1$, find the following lengths.



4. HI 4

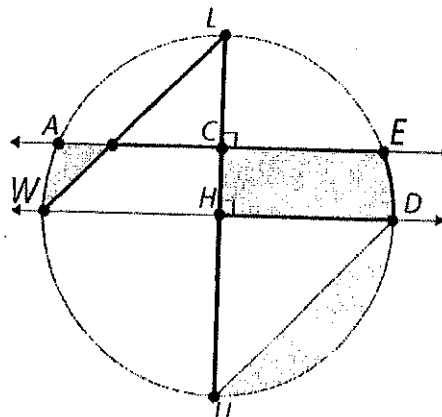
5. JK 4

6. HJ 5

7. IK 5

8. Walch Education contracted Ryan Icons to design a logo for the company. They requested the logo be circular and contain the following elements:

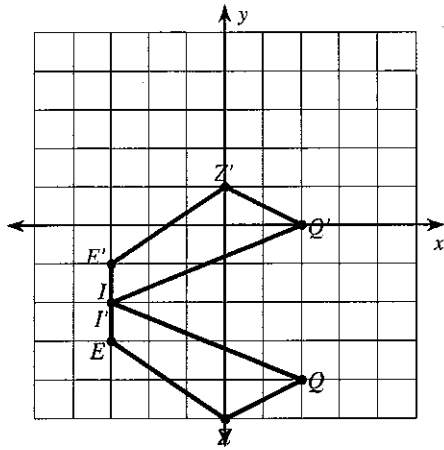
- a line WD
- a ray HD
- a line segment CH
- 2 pairs of parallel lines AE || WD
- 1 pair of perpendicular lines LU ⊥ WD
- Identify the elements requested in the submitted logo shown.



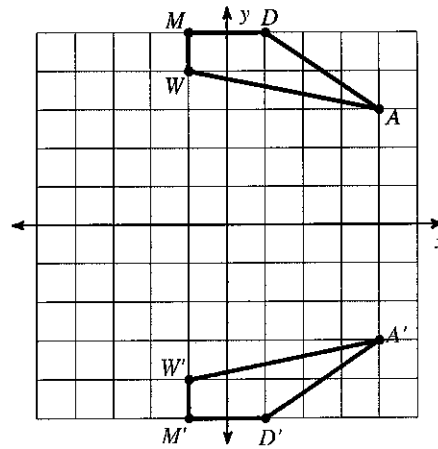
Reflections

Graph the image of the figure using the transformation given.

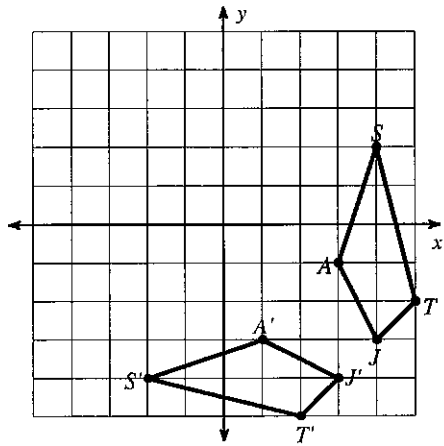
1) reflection across $y = -2$



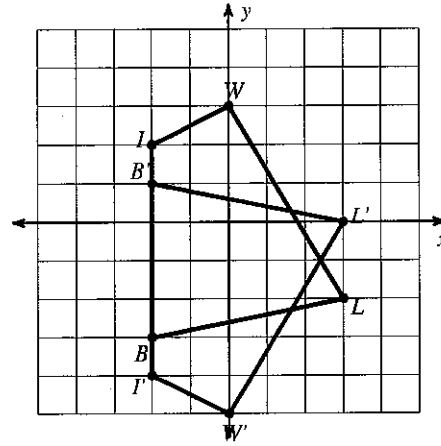
2) reflection across the x -axis



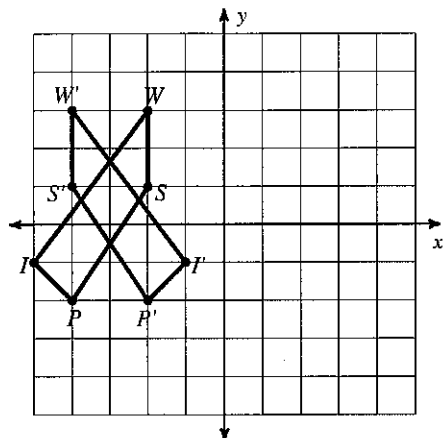
3) reflection across $y = -x$



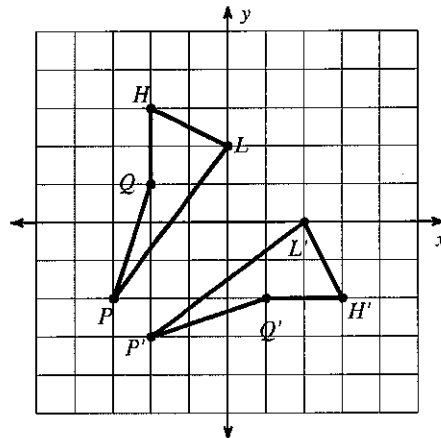
4) reflection across $y = -1$



5) reflection across $x = -3$

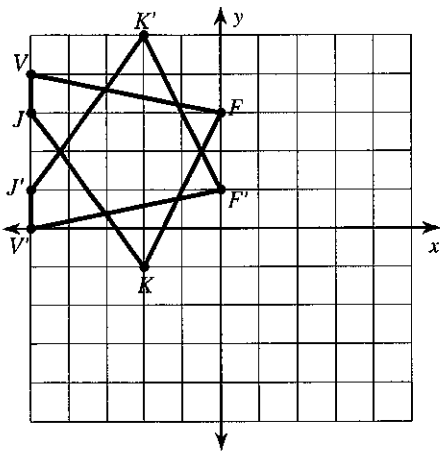


6) reflection across $y = x$



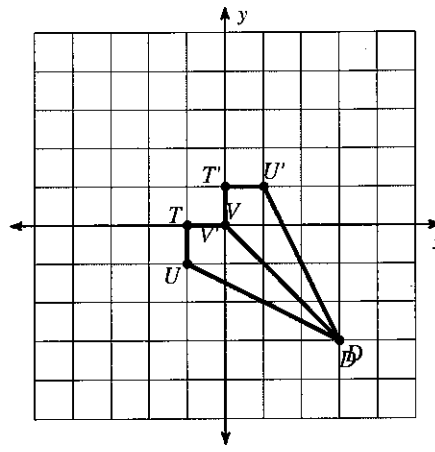
Write a rule to describe each transformation.

7)



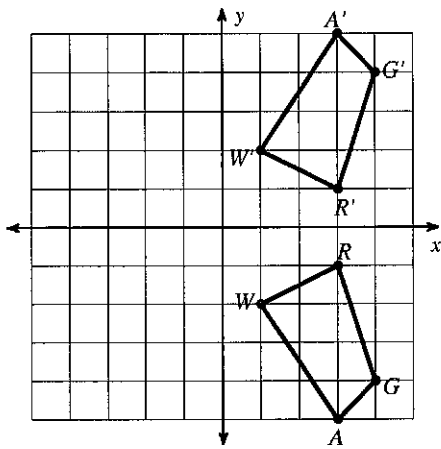
reflection across $y = 2$

8)



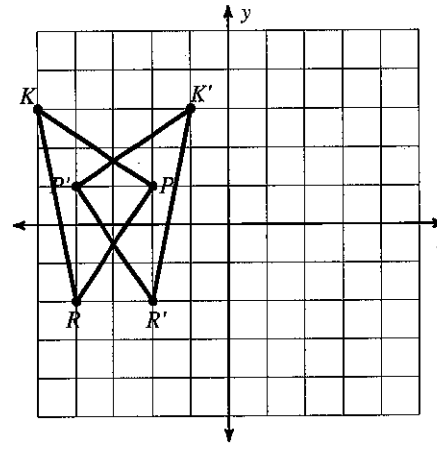
reflection across $y = -x$

9)



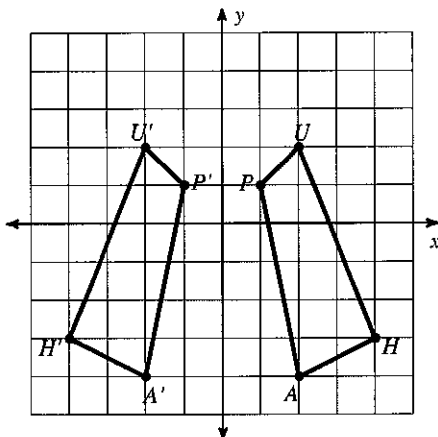
reflection across the x-axis

10)



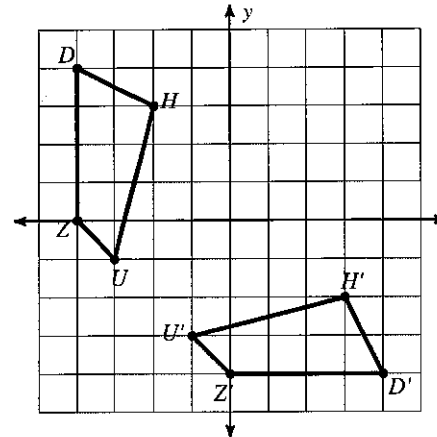
reflection across $x = -3$

11)



reflection across the y-axis

12)

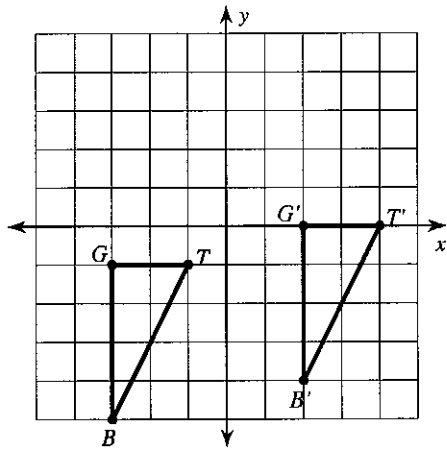


reflection across $y = x$

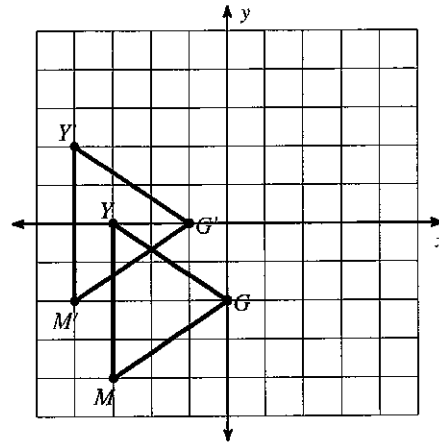
Translations

Graph the image of the figure using the transformation given.

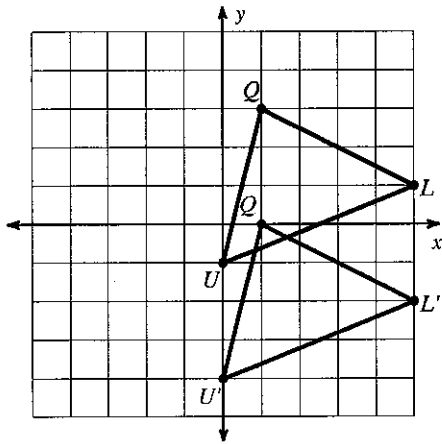
1) translation: 5 units right and 1 unit up



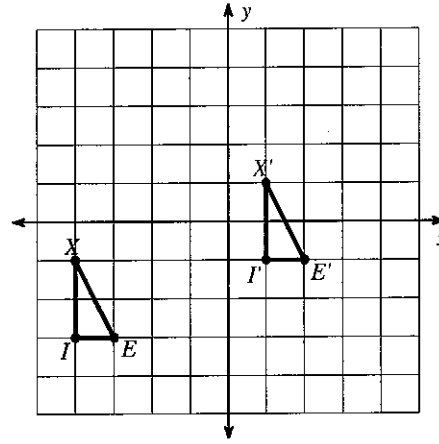
2) translation: 1 unit left and 2 units up



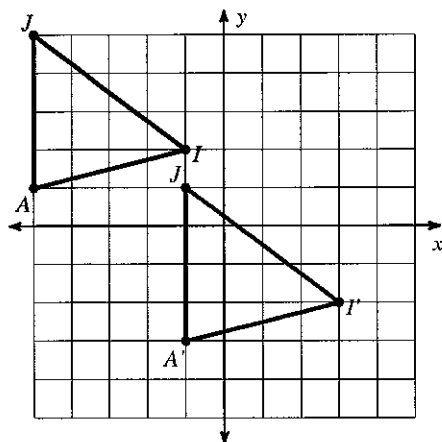
3) translation: 3 units down



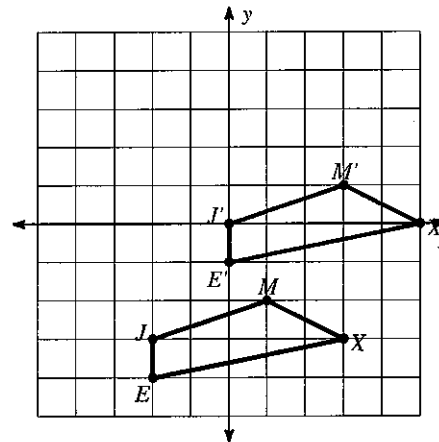
4) translation: 5 units right and 2 units up



5) translation: 4 units right and 4 units down

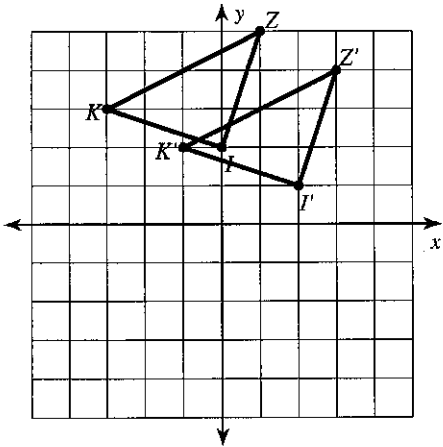


6) translation: 2 units right and 3 units up



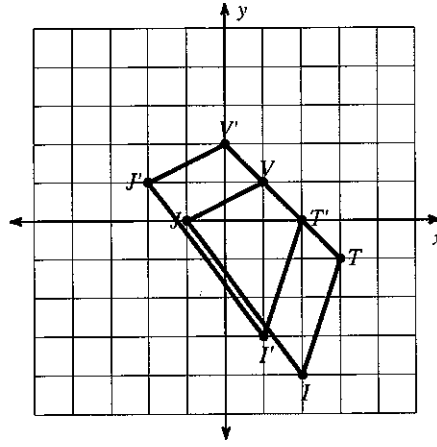
Write a rule to describe each transformation.

7)



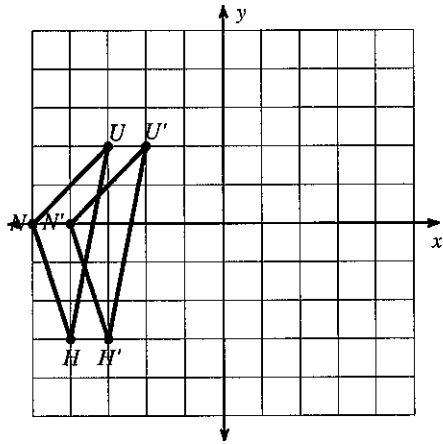
translation: 2 units right and 1 unit down

8)



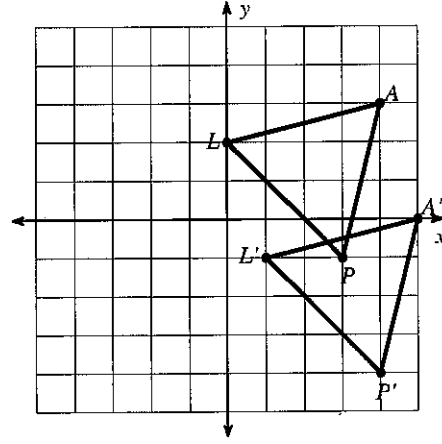
translation: 1 unit left and 1 unit up

9)



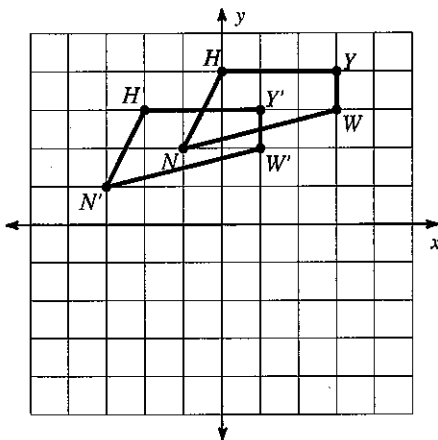
translation: 1 unit right

10)



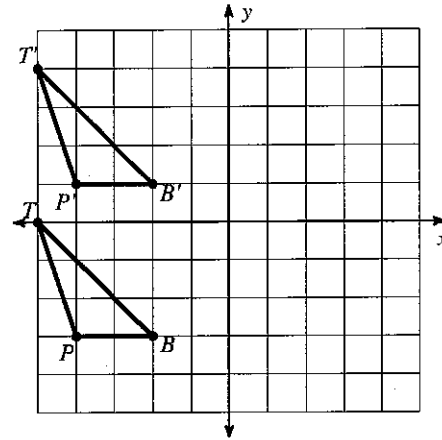
translation: 1 unit right and 3 units down

11)



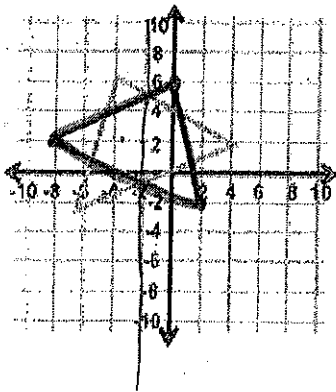
translation: 2 units left and 1 unit down

12)

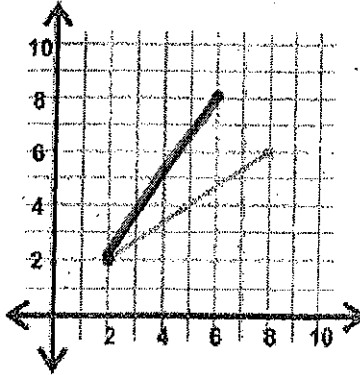


translation: 4 units up

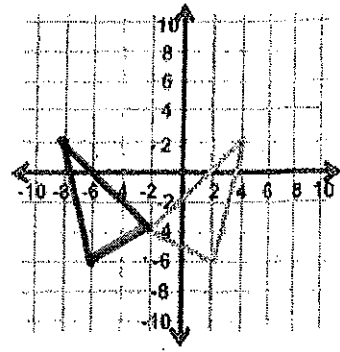
d. $x = -2$



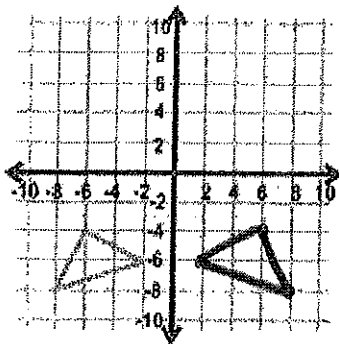
e. $y = x$



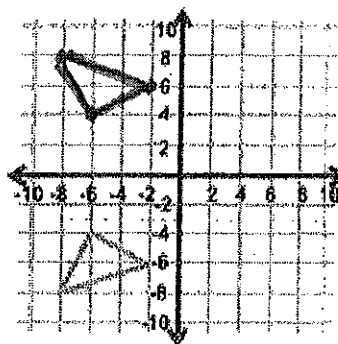
f. $x = -2$



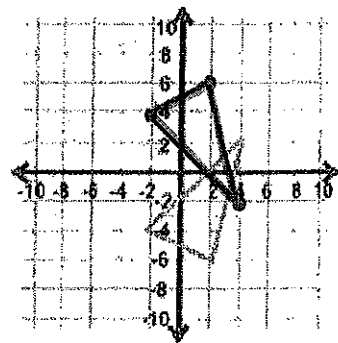
g. y - axis



h. x - axis



i. x - axis



Translations

- (x', y')
- $(x, y) \rightarrow (x-3, y+2)$
 - $(2, 7) \rightarrow (-1, 9)$
 - $(-3, -2) \rightarrow (-6, 0)$
 - $(0, 9) \rightarrow \underline{(-3, 11)}$
 - $(-5, -1) \rightarrow \underline{(-8, 1)}$
 - $(-1, 17) \rightarrow \underline{(-4, 19)}$

$(x-3, y+2)$
Find the preimage

- | | |
|------------------------|-------------------------|
| (x', y') | (x, y) |
| $(3, 5) \rightarrow$ | $(6, 3)$ |
| $(-2, -5) \rightarrow$ | $(1, -7)$ |
| $(6, -1) \rightarrow$ | $\underline{(9, -3)}$ |
| $(-5, -9) \rightarrow$ | $\underline{(-2, -11)}$ |
| $(0, 8) \rightarrow$ | $\underline{(3, 6)}$ |

Name: _____ Date: _____

Translations and Reflections Homework

1. Use the translation $(x, y) \rightarrow (x + 5, y - 9)$ for questions a-e.

- a. What is the image of A (-6, 3)? $A'(-1, -6)$
- b. What is the image of (4, 8)? $(9, -1)$
- c. What is the image of (5, -3)? $(10, -12)$
- d. What is the image of A' from #1, which would be called A''? $A''(4, -15)$
- e. What is the pre-image of D'(12, 7)? $D(7, 16)$

2. The vertices of $\triangle ABC$ are A(-6, -7), B(-3, -1), and C(-5, 2). Find the vertices of $\triangle A'B'C'$, given the translation rules below.

- a. $(x, y) \rightarrow (x - 2, y - 7)$ $A'(-8, -14)$ $B'(-5, -8)$ $C'(-7, -5)$
- b. $(x, y) \rightarrow (x + 11, y + 4)$ $A'(5, -3)$ $B'(8, 3)$ $C'(6, 6)$
- c. $(x, y) \rightarrow (x, y - 3)$ $A'(-6, -10)$ $B'(-3, -4)$ $C'(-5, -1)$
- d. $(x, y) \rightarrow (x - 5, y + 8)$ $A'(-11, 1)$ $B'(-8, 7)$ $C'(-10, 10)$

3. $\triangle A'B'C'$ is the image of $\triangle ABC$. Write the translation rule.

a. $(x - 6, y + 2)$

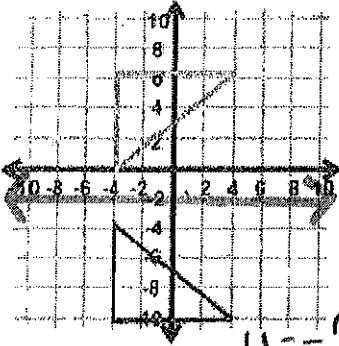
$(x + 9, y - 7)$

c. $(x - 3, y - 5)$

$(x + 8, y + 4)$

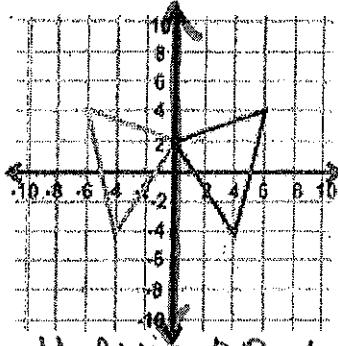
4. Find the line of reflection between the pre-image and the image.

a.



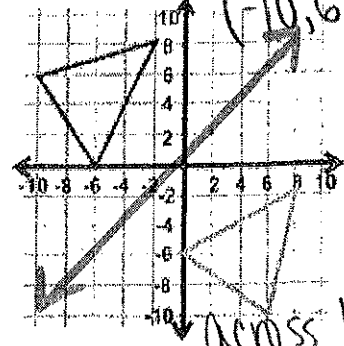
$y = -2$

b.



y -axis OR $x = 0$

c.



across line $y = x$

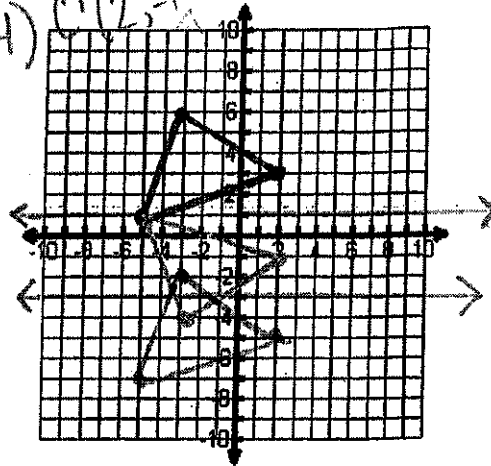
5. Two Reflections The vertices of $\triangle ABC$ are $A(-5, 1)$, $B(-3, 6)$, and $C(2, 3)$. Use this information to answer questions a-d.

- Plot $\triangle ABC$ on the coordinate plane.
- Reflect $\triangle ABC$ over $y = 1$. Find the coordinates of $\triangle A'B'C'$.
- Reflect $\triangle A'B'C'$ over $y = -3$. Find the coordinates of $\triangle A''B''C''$.
- What one transformation would be the same as this double reflection?

$A'(-5, 1) B'(-3, 4) C'(2, -1)$

$A''(2, -5) B''(-3, -2) A''(-5, -7)$

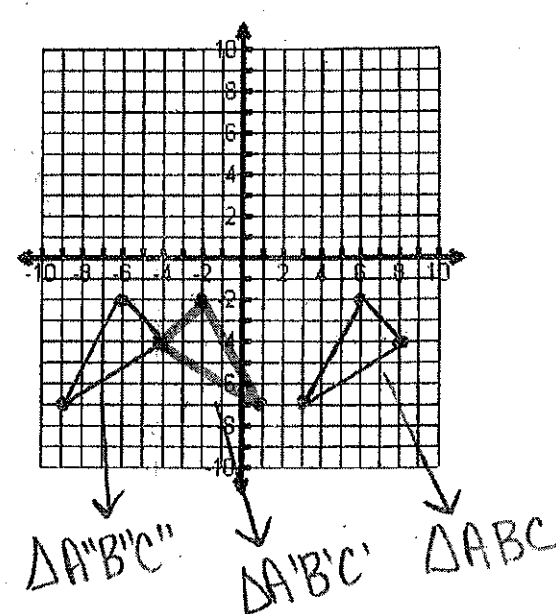
translation



6. Two Reflections The vertices of $\triangle ABC$ are $A(6, -2)$, $B(8, -4)$, and $C(3, -7)$. Use this information to answer questions a-d.

- Plot $\triangle ABC$ on the coordinate plane.
- Reflect $\triangle ABC$ over $x = 2$. Find the coordinates of $\triangle A'B'C'$.
- Reflect $\triangle A'B'C'$ over $x = -4$. Find the coordinates of $\triangle A''B''C''$.
- What one transformation would be the same as this double reflection?

translation

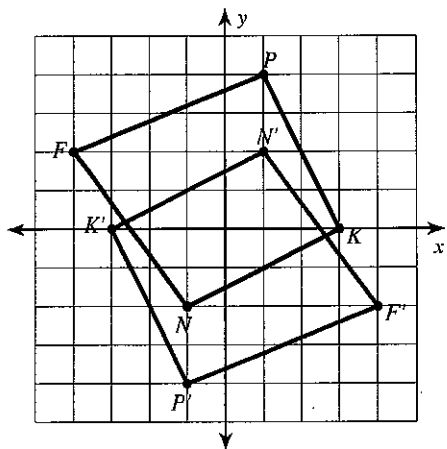


$\triangle A''B''C''$ $\triangle A'B'C'$ $\triangle ABC$

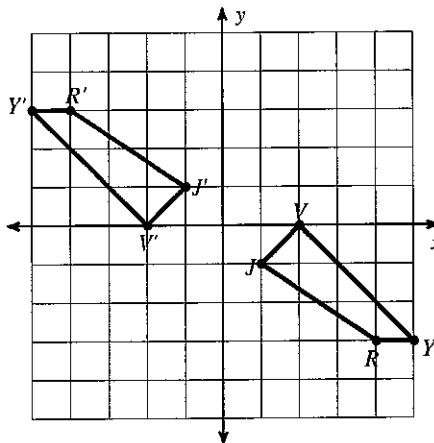
Rotations

Graph the image of the figure using the transformation given.

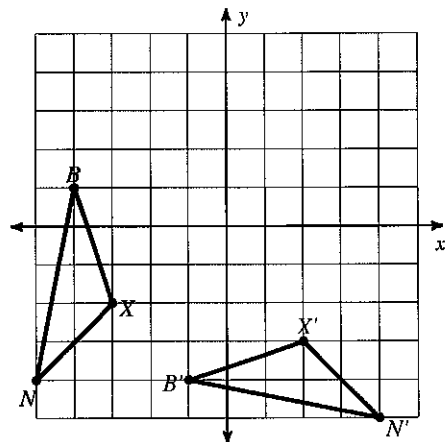
1) rotation 180° about the origin



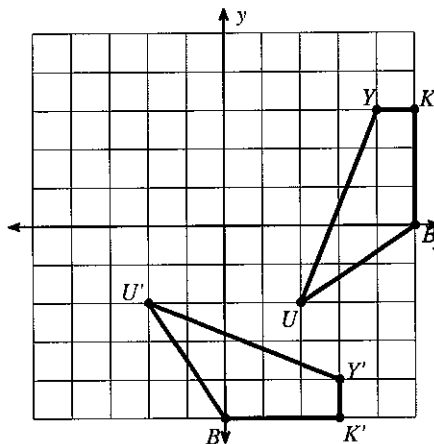
2) rotation 180° about the origin



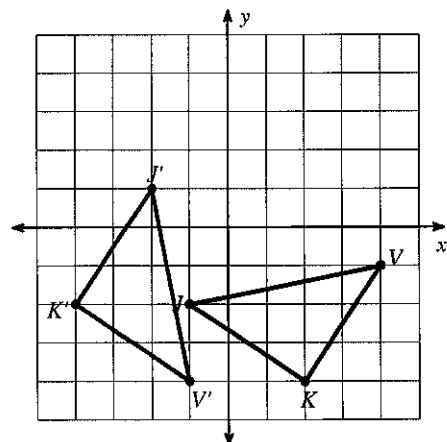
3) rotation 90° counterclockwise about the origin



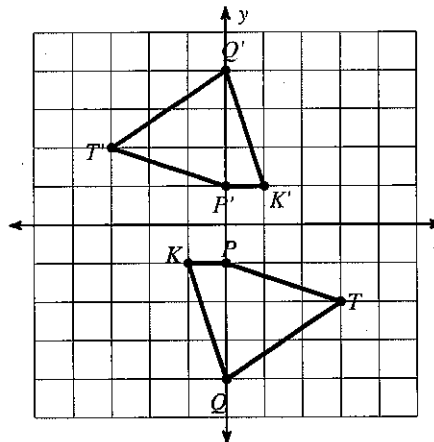
4) rotation 90° clockwise about the origin



5) rotation 90° clockwise about the origin

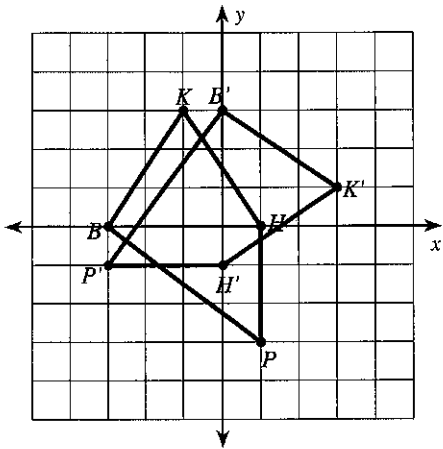


6) rotation 180° about the origin



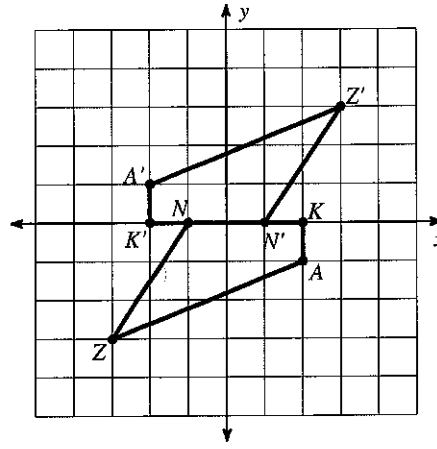
Write a rule to describe each transformation.

7)



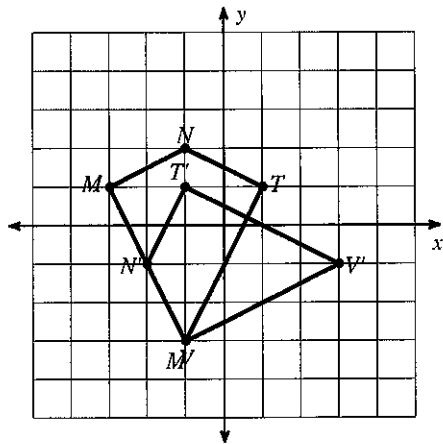
rotation 90° clockwise about the origin

8)



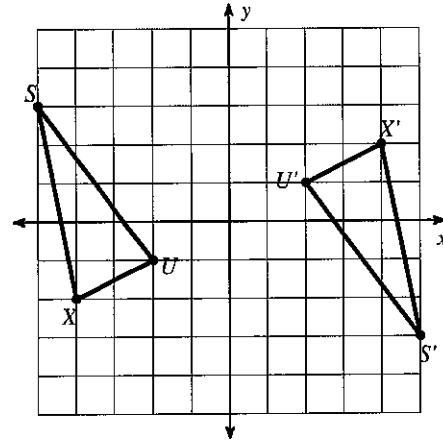
rotation 180° about the origin

9)



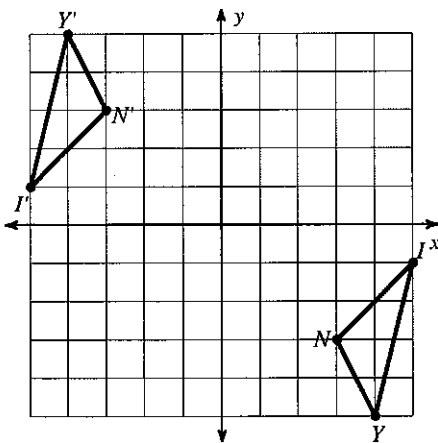
rotation 90° counterclockwise about the origin

10)



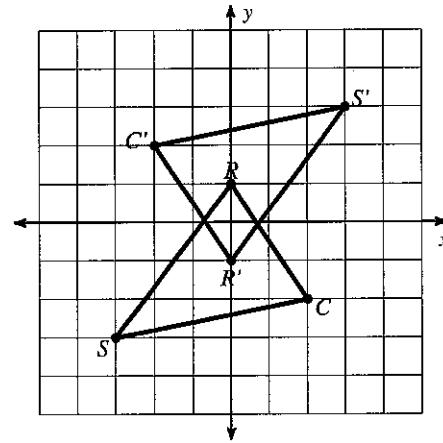
rotation 180° about the origin

11)



rotation 180° about the origin

12)



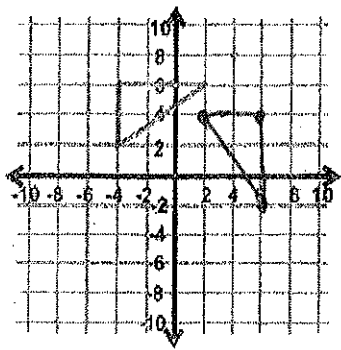
rotation 180° about the origin

Name: _____ Date: _____

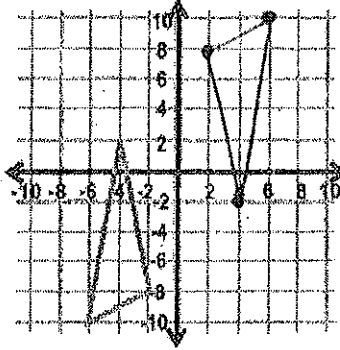
Rotations Homework

1. Rotate each figure about the origin using the given clockwise angle.

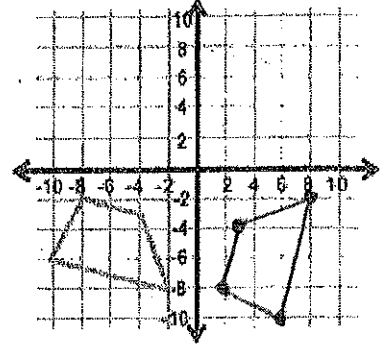
a. 90°



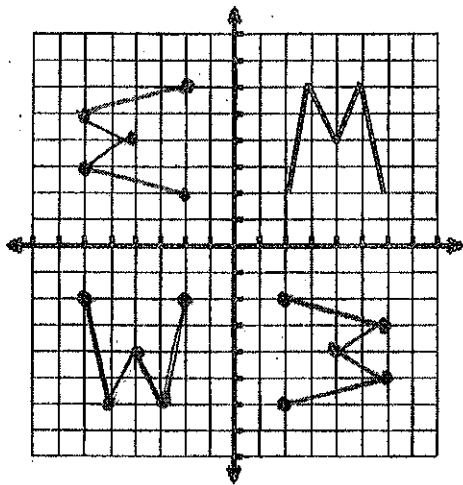
b. 180°



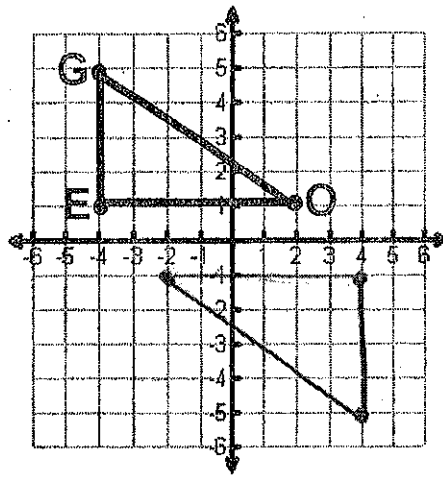
c. 270°



d. 90° , 180° , and 270°

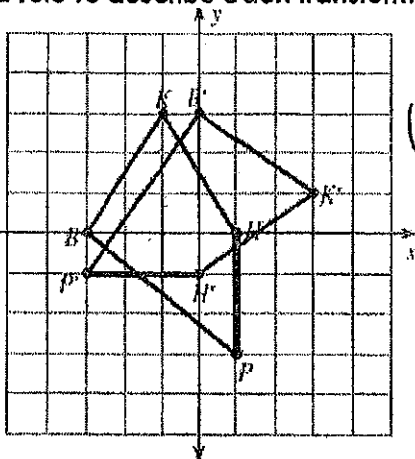


e. 180°

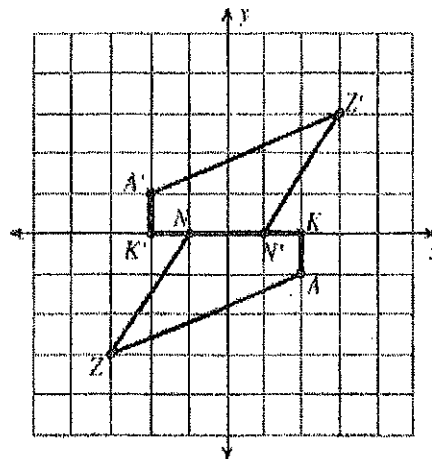


2. Write a rule to describe each transformation.

180°
or
 180°



$(-1, 3) \rightarrow (3, 1)$

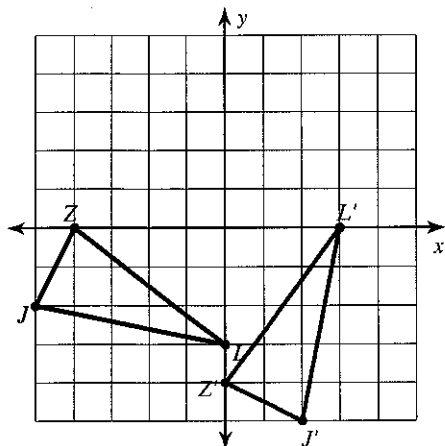


180°
 $(-2, 1) \rightarrow (2, -1)$

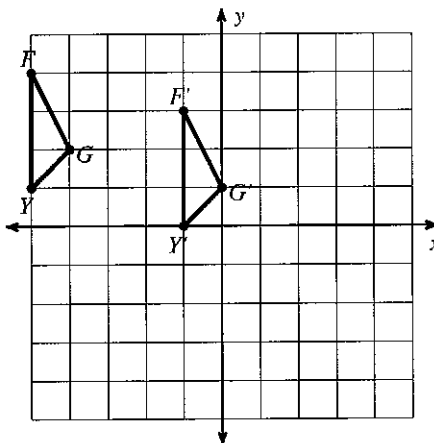
All Transformations

Graph the image of the figure using the transformation given.

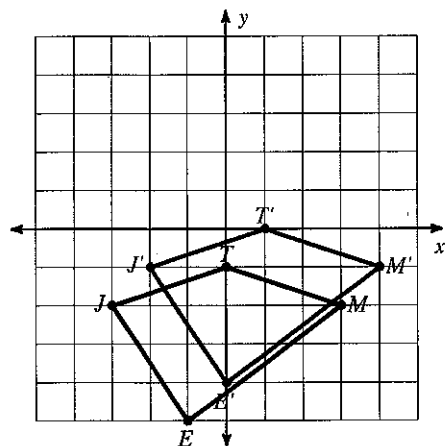
1) rotation 90° counterclockwise about the origin



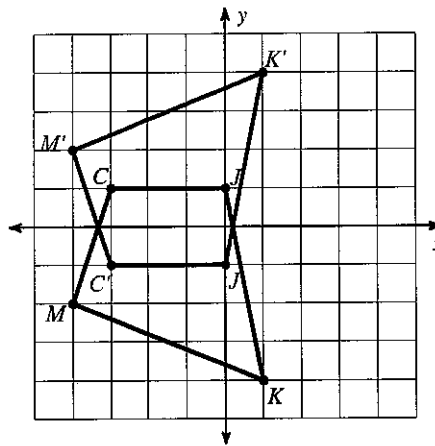
2) translation: 4 units right and 1 unit down



3) translation: 1 unit right and 1 unit up

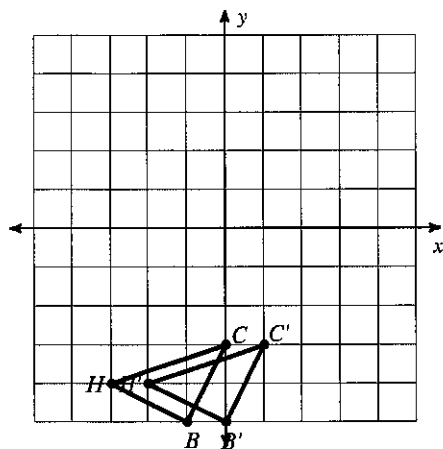


4) reflection across the x-axis



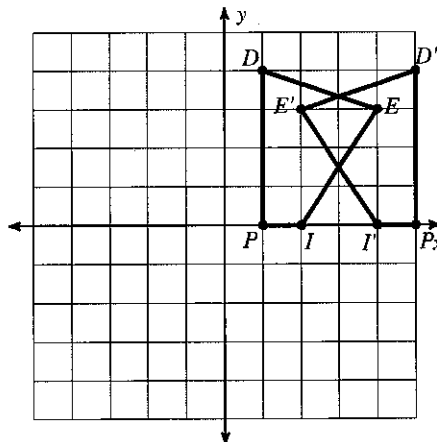
Write a rule to describe each transformation.

5)



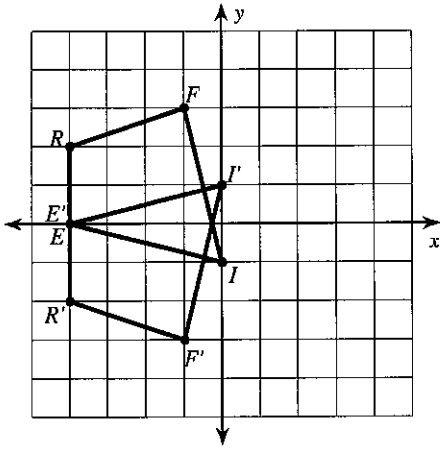
translation: 1 unit right

6)



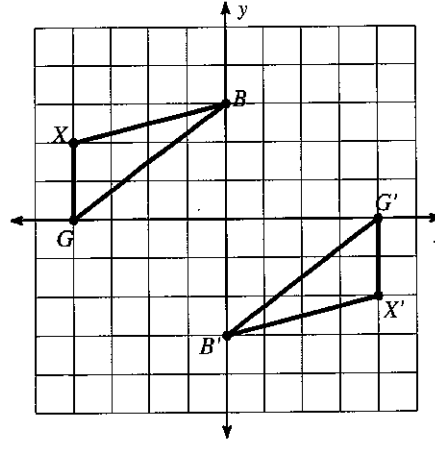
reflection across $x = 3$

7)



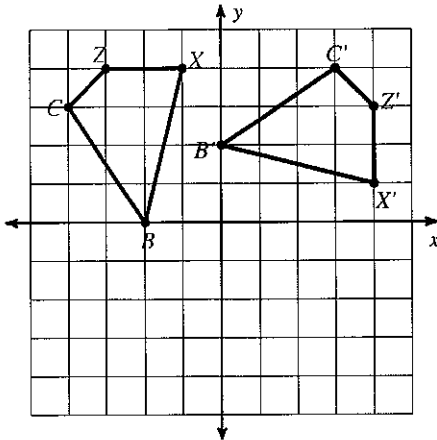
reflection across the x-axis

8)

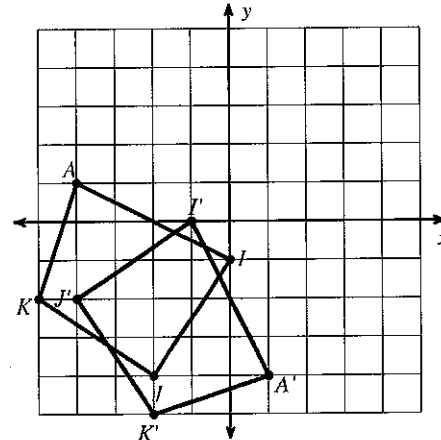
rotation 180° about the origin

Graph the image of the figure using the transformation given.

- 9) rotation 90° clockwise about the origin
 $B(-2, 0)$, $C(-4, 3)$, $Z(-3, 4)$, $X(-1, 4)$



- 10) reflection across $y = x$
 $K(-5, -2)$, $A(-4, 1)$, $I(0, -1)$, $J(-2, -4)$



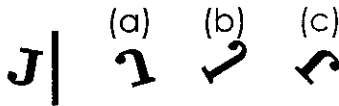
Find the coordinates of the vertices of each figure after the given transformation.

- 11) rotation 180° about the origin
 $E(2, -2)$, $J(1, 2)$, $R(3, 3)$, $S(5, 2)$
 $E'(-2, 2)$, $J'(-1, -2)$, $R'(-3, -3)$, $S'(-5, -2)$
- 12) reflection across $y = 2$
 $J(1, 3)$, $U(0, 5)$, $R(1, 5)$, $C(3, 2)$
 $U'(0, -1)$, $R'(1, -1)$, $C'(3, 2)$, $J'(1, 1)$
- 13) translation: 7 units right and 1 unit down
 $J(-3, 1)$, $F(-2, 3)$, $N(-2, 0)$
 $J'(4, 0)$, $F'(5, 2)$, $N'(5, -1)$
- 14) translation: 6 units right and 3 units down
 $S(-3, 3)$, $C(-1, 4)$, $W(-2, -1)$
 $S'(3, 0)$, $C'(5, 1)$, $W'(4, -4)$

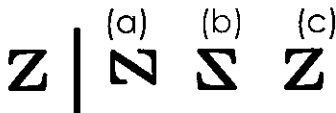
Name: _____ KEY _____

Date: _____

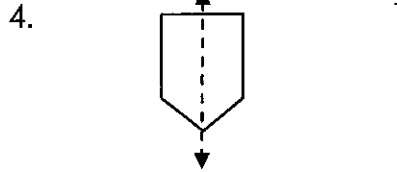
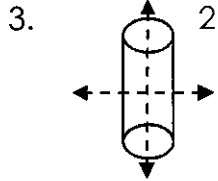
1. Which one of the images can be **rotated** to match the letter J on the left?



2. Which one of the images can be **reflected** to match the letter Z on the left?

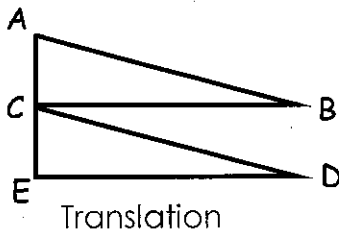


How many lines of symmetry does the given object appear to have?

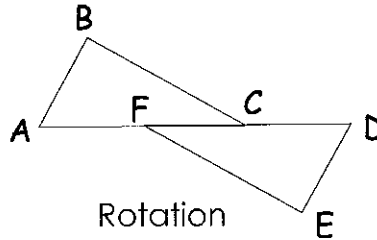


Name the transformation that maps:

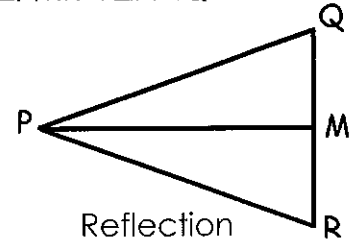
5. $\triangle ABC \rightarrow \triangle CDE$



6. $\triangle ABC \rightarrow \triangle DEF$

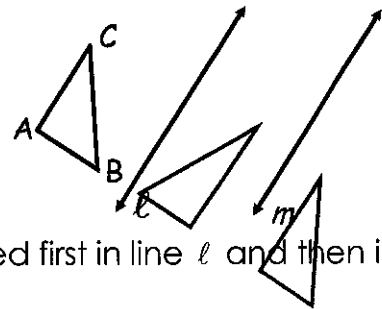


7. $\triangle PMR \rightarrow \triangle PMQ$



8. In the diagram, $\ell \parallel m$ and $\triangle ABC$ is reflected first in line ℓ and then in line m . This set of reflections is equivalent to doing what kind of singular transformation?

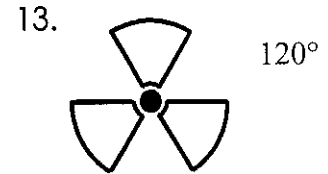
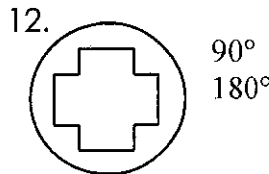
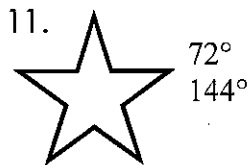
Translation



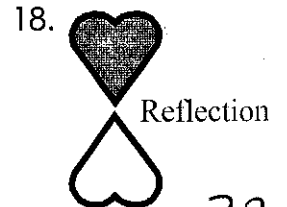
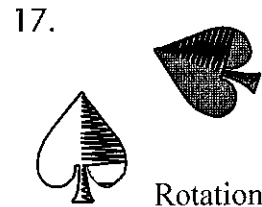
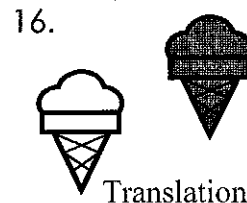
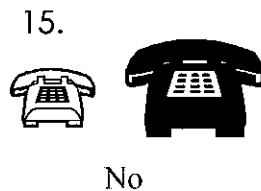
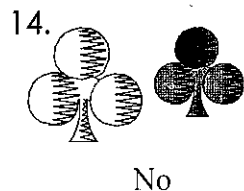
9. If ℓ and m were intersecting lines, and $\triangle ABC$ was reflected first in line ℓ and then in line m , what would the resulting transformation be?

Rotation

Describe any **rotations** (of 180° or less) that will map each figure onto itself.

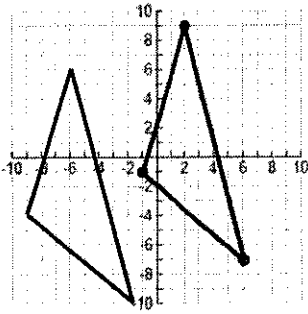


An isometry is a transformation in the plane that preserves length. Identify each **transformation** and each **isometry**. (Preimages are unshaded and images are shaded.)

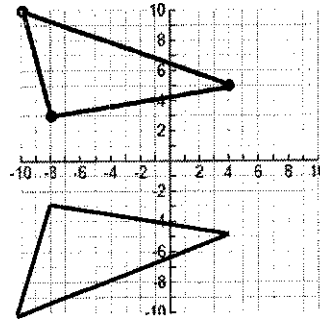


Draw the image of each figure, using the given transformation.

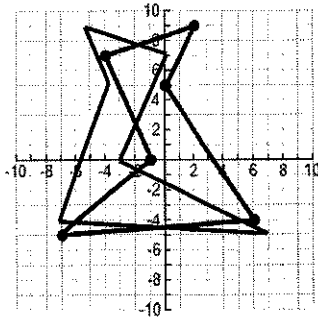
19. Translation $(x, y) \rightarrow (x - 8, y - 3)$



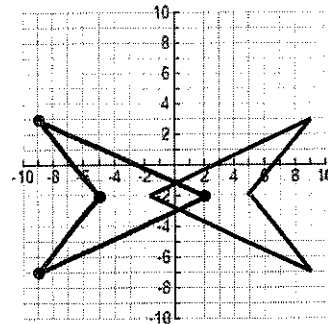
20. Reflection across the **x-axis**.



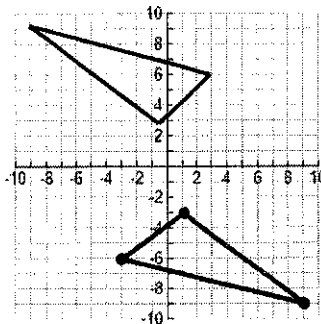
21. Reflection across the line $x = -2$



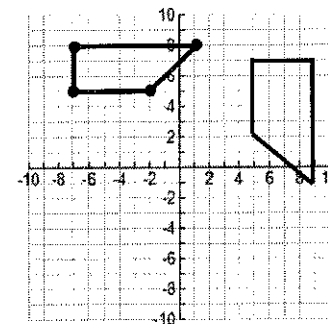
21. Reflection across the **y-axis**.



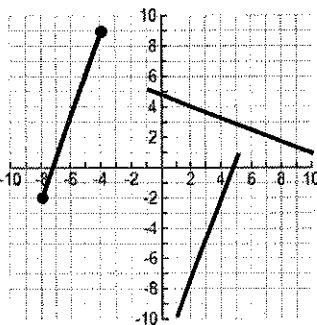
23. Rotation 180° about the origin



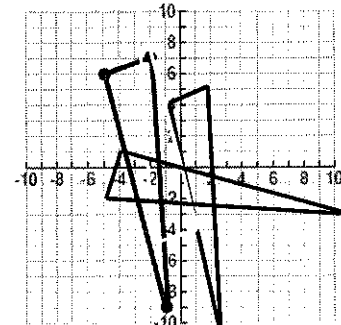
24. Rotation 90° clockwise about the origin.



25. Translation $(x, y) \rightarrow (x + 9, y - 8)$
Rotation 90° CCW about the origin



26. Translation $(x, y) \rightarrow (x + 4, y - 2)$
Rotation 180° about the origin.
Reflection about the line $y = x$.



Examine the diagram. Note that B' is at the same point as B, and C' is at the same point as C, although these are not labeled.

27. Is this an isometry? Is it a dilation?

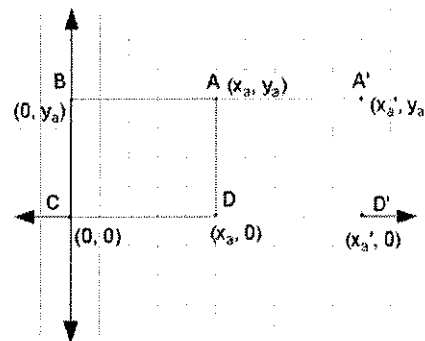
No No

28. What transformation has taken place to map ABCD to A'B'C'D'? Be specific.

Horizontal Stretch

29. Write the function/rule that maps ABCD to A'B'C'D'.

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

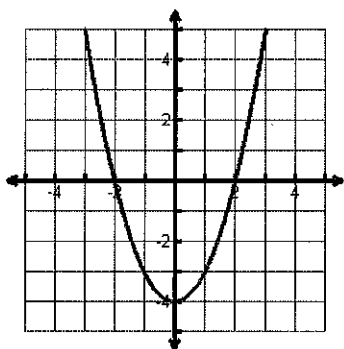


Specify if the following equations or graphs are **even**, **odd**, or **neither**.

30. $y = 2x^3 - 4$

Neither

34.



Even

31. $y = 5x^6 - 4x^2$

Even

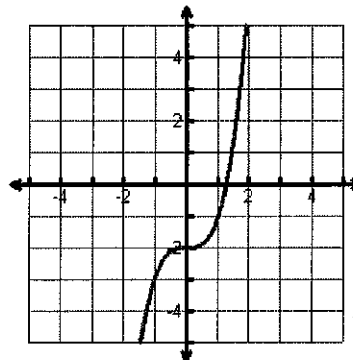
32. $y = 10$

Even

33. $y = \frac{1}{2}x$

Odd

35.



Neither

36. Given $f(x)$ is odd and point $A(-4, 19)$ is a point on the function. Name another point on the **odd function**. $(4, -19)$

37. Given $h(x)$ is odd and point $B(16, -21)$ is a point on the function. Name another point on the **odd function**. $(-16, 21)$

38. Given $f(x)$ is even and point $C(-14, -16)$ is a point on the function. Name another point on the **even function**. $(14, -16)$

39. Given $f(x)$ is even and point $D(34, 40)$ is a point on the function. Name another point on the **even function**. $(-34, 40)$