

Warm Up

4/9

What does the following rule describe?

$$(x, y) \longrightarrow (x - 6, y + 2)$$

The figure is moved 6 units to the left and 2 units up.

If this rule were applied to a figure, would the image be

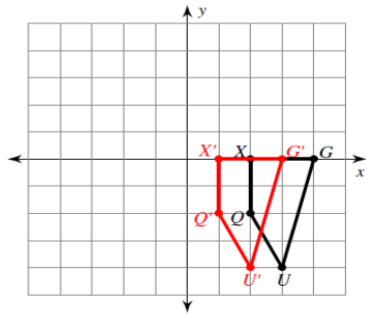
SIMILAR or **CONGRUENT**

to the pre-image?

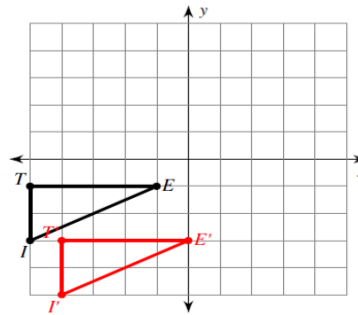
Homework Questions?

Graph the image of the figure using the transformation given.

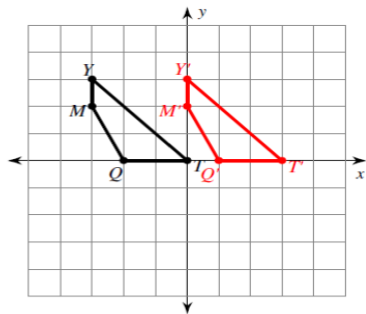
- 1) translation: 1 unit left



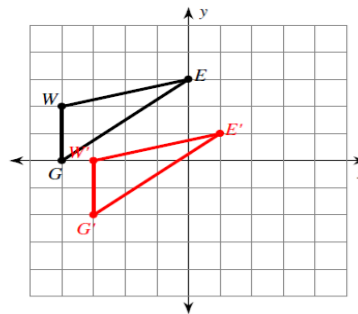
- 2) translation: 1 unit right and 2 units down



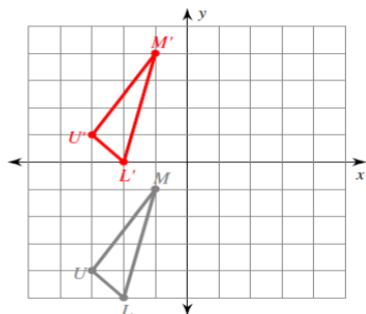
- 3) translation: 3 units right



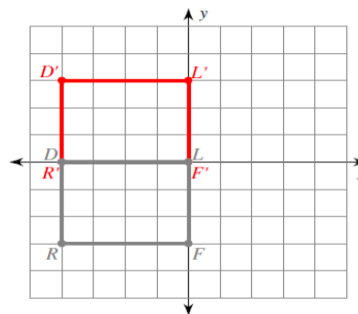
- 4) translation: 1 unit right and 2 units down



- 5) translation: 5 units up
 $U(-3, -4)$, $M(-1, -1)$, $L(-2, -5)$



- 6) translation: 3 units up
 $R(-4, -3)$, $D(-4, 0)$, $L(0, 0)$, $F(0, -3)$



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

- 7) translation: 2 units left and 1 unit down
 $Q(0, -1), D(-2, 2), V(2, 4), J(3, 0)$

$Q'(-2, -2), D'(-4, 1), V'(0, 3), J'(1, -1)$

- 8) translation: 2 units down
 $D(-4, 1), A(-2, 5), S(-1, 4), N(-1, 2)$

$D'(-4, -1), A'(-2, 3), S'(-1, 2), N'(-1, 0)$

- 9) translation: 4 units left and 4 units up
 $J(-1, -2), A(-1, 0), N(3, -3)$

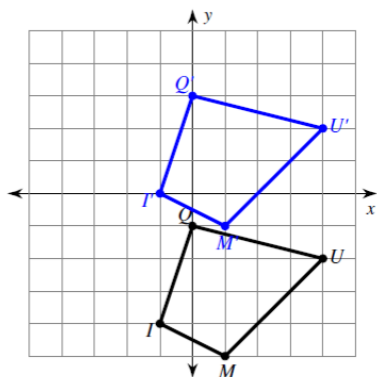
$J'(-5, 2), A'(-5, 4), N'(-1, 1)$

- 10) translation: 3 units right and 4 units up
 $Z(-4, -3), I(-2, -2), V(-2, -4)$

$Z'(-1, 1), I'(1, 2), V'(1, 0)$

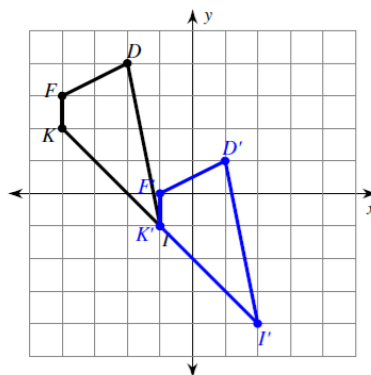
Write a rule to describe each transformation.

11)



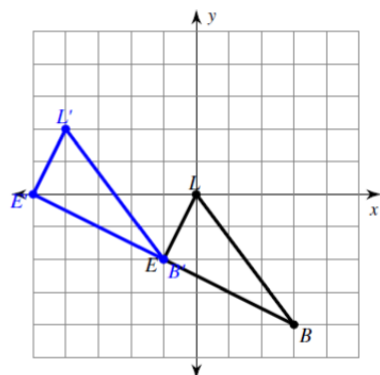
translation: 4 units up

12)



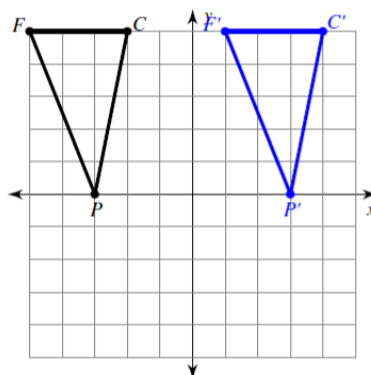
translation: 3 units right and 3 units down

13)



translation: 4 units left and 2 units up

14)



translation: 6 units right

Arrow notation recap for translations

Move $\triangle ABC$ 3 units right, 7 units down

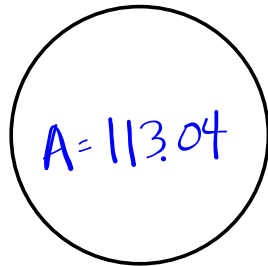
$$(x, y) \rightarrow (x + 3, y - 7)$$

Move $\triangle DEF$ 6 units left

$$(x, y) \rightarrow (x - 6, y - 0)$$
$$(x - 6, y)$$

IXL Questions?

What is the circumference of a circle with area = 113.04 cm^2 ?



We need to know the radius to find the circumference.

$$A = \pi r^2$$

$$\frac{113.04}{3.14} = \frac{\pi r^2}{3.14}$$

$$\sqrt{36} = \sqrt{r^2}$$
$$6 = r$$

$$C = 2\pi r$$

$$C = 2(3.14)6$$

$$C = 37.68 \text{ cm}$$

A rectangle has an area of 30 m^2 and a perimeter of 26 m. What are the dimensions?

$$L \cdot W = 30$$

$$P = 2L + 2W = 26$$

Factors of 30?

L W

1, 30

2, 15

3, 10

5, 6

$$P = 2L + 2W$$

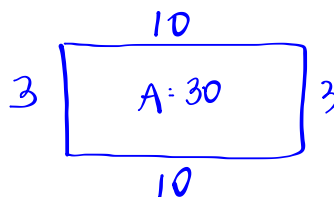
62

34

26

22

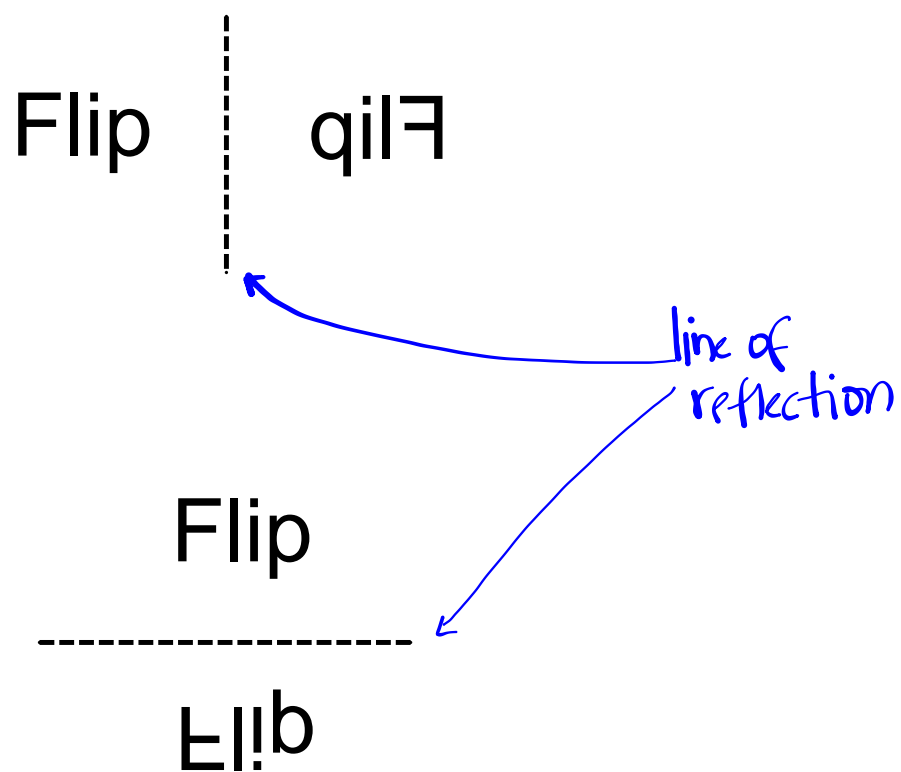
Dimensions are 3×10



New transformation ...

REFLECTION
KERFECTION

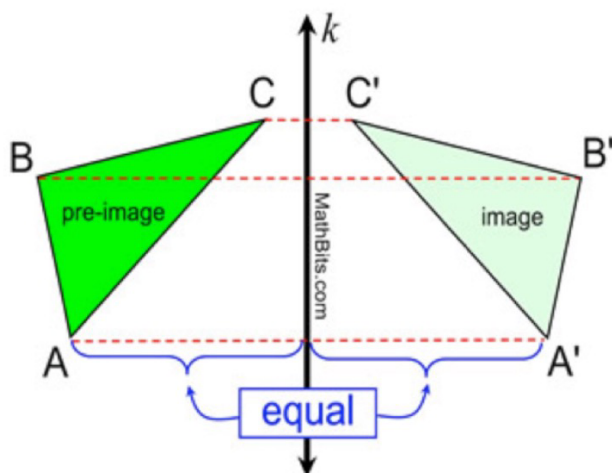
Reflection



Reflections - Notes

A **reflection** is a transformation which flips the figure over a line.

This line is called the line of reflection.



Rules for Reflections:

- Every point of the Image is moved to the other side of the line of reflection.
- Each point in the Image is the same distance from the line of reflection as the corresponding point in the preimage.
- The image is reflected at a 90° angle to the Line of Reflection.
- The image and the preimage are congruent.

Example 1:

$\triangle ABC$ is being reflected over the x -axis.

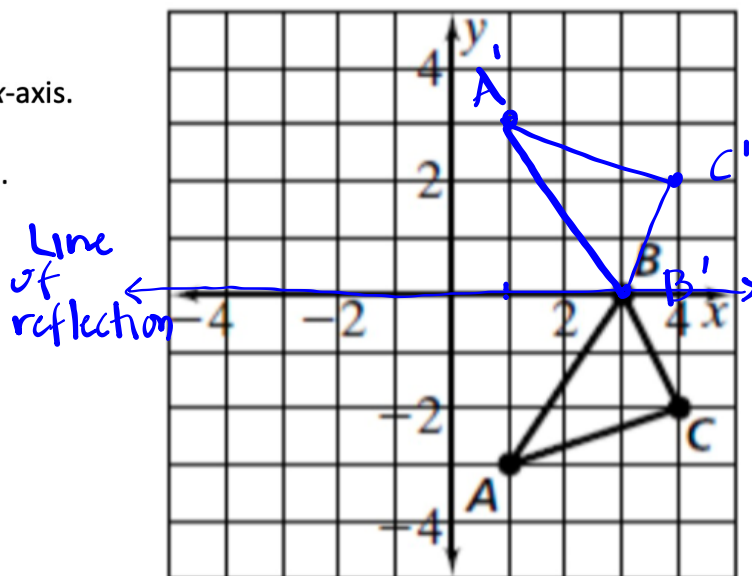
Draw and label the image $\triangle A'B'C'$.

What are the coordinates of:

$$A \underline{(1, -3)} \rightarrow A' \underline{(1, 3)}$$

$$B \underline{(3, 0)} \rightarrow B' \underline{(3, 0)}$$

$$C \underline{(4, -2)} \rightarrow C' \underline{(4, 2)}$$



Can you write a general rule for a reflection across the x -axis?

$$(x, y) \rightarrow (\underline{x} , \underline{-y}).$$

(you don't need to memorize this rule)

Example 2:

$\triangle ABC$ is reflected over the y -axis.

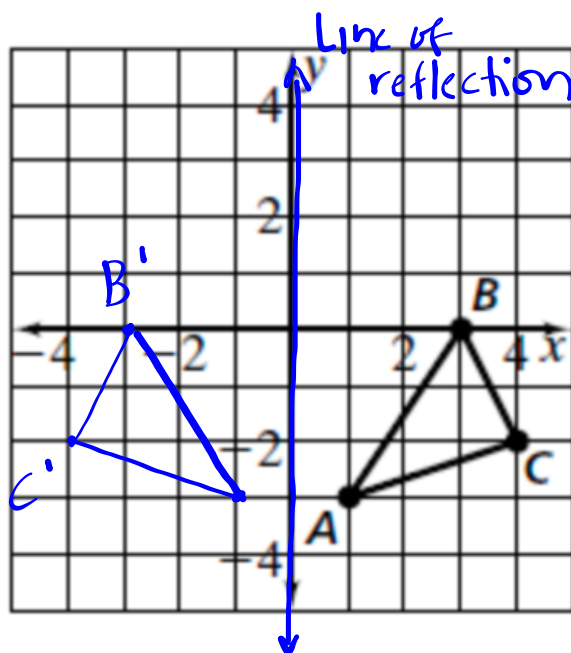
Draw the image $\triangle A'B'C'$.

What are the coordinates of:

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

$$B(3, 0) \rightarrow B'(-3, 0)$$

$$C(4, -2) \rightarrow C'(-4, -2)$$



Write a general rule for a reflection over the y -axis:

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

(you don't need to memorize this rule)

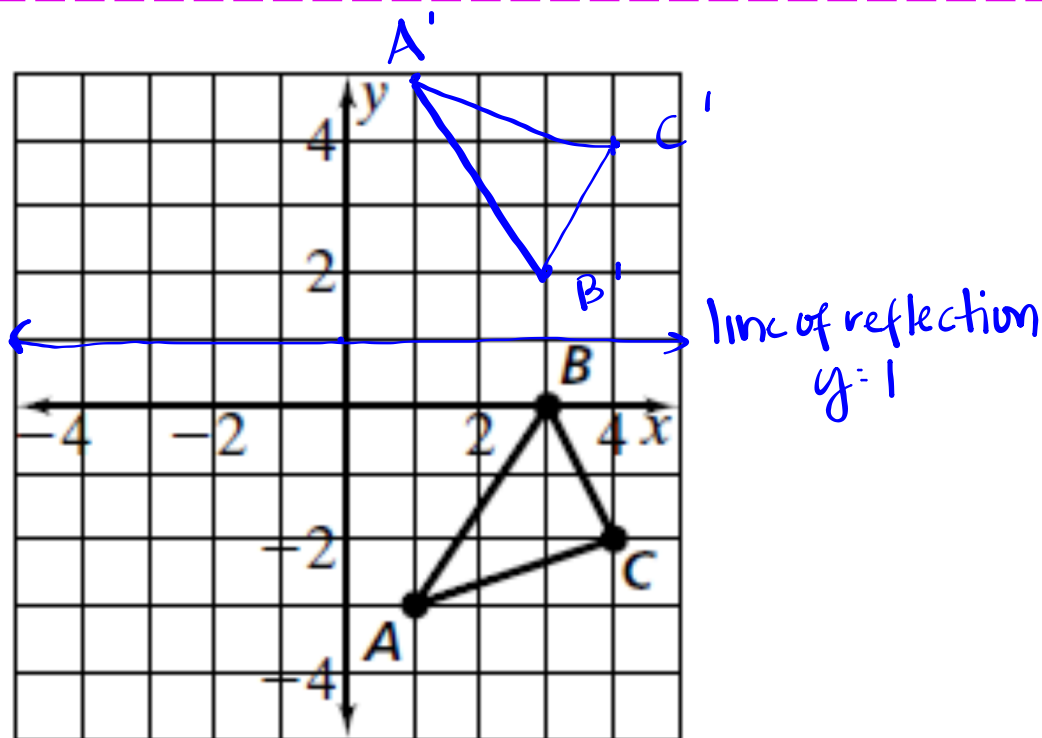
We can also reflect over a line that is not an axis.

Example 3:

$\triangle ABC$ is reflected over the line $y = 1$. Draw the image $\triangle A'B'C'$.

Steps to reflecting over a line that is not one of the axes:

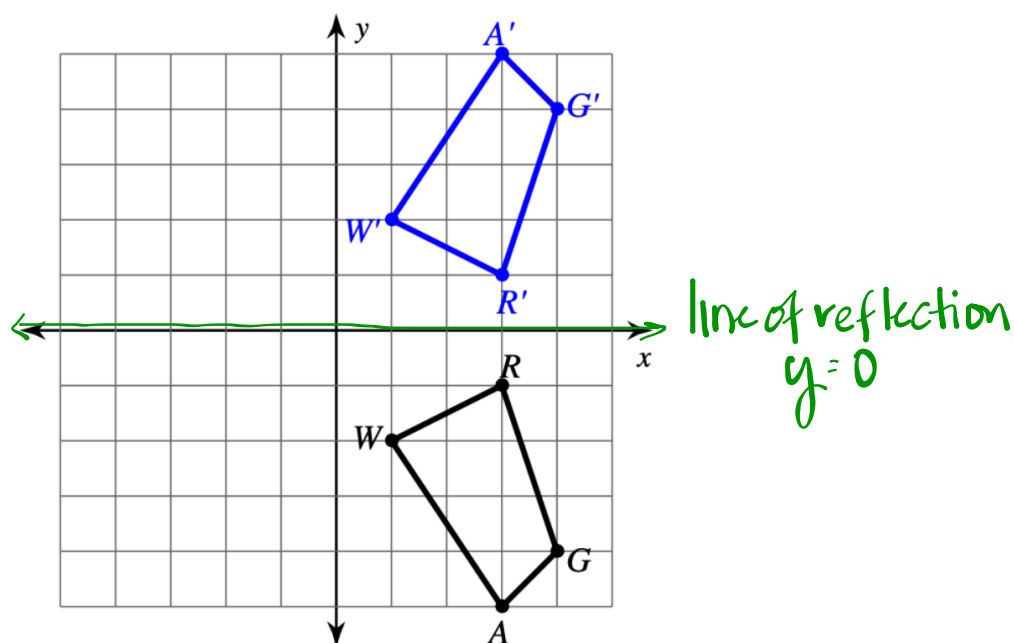
1. Draw your line of reflection on the graph
2. Move each point perpendicular **across** the line so that the new point is the same distance from the line of reflection as the original point.



Example 4:

Write the reflections that must have occurred.

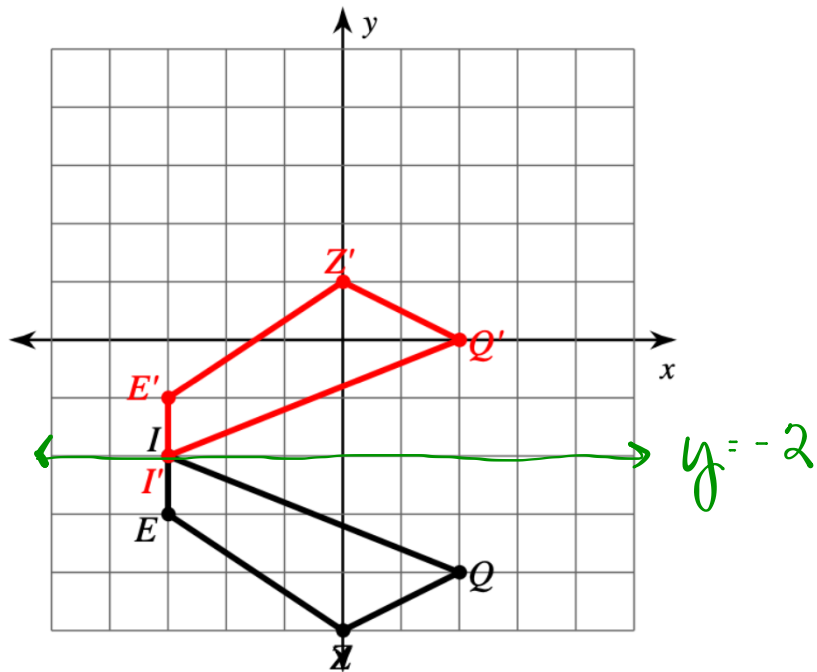
A.



Example 4:

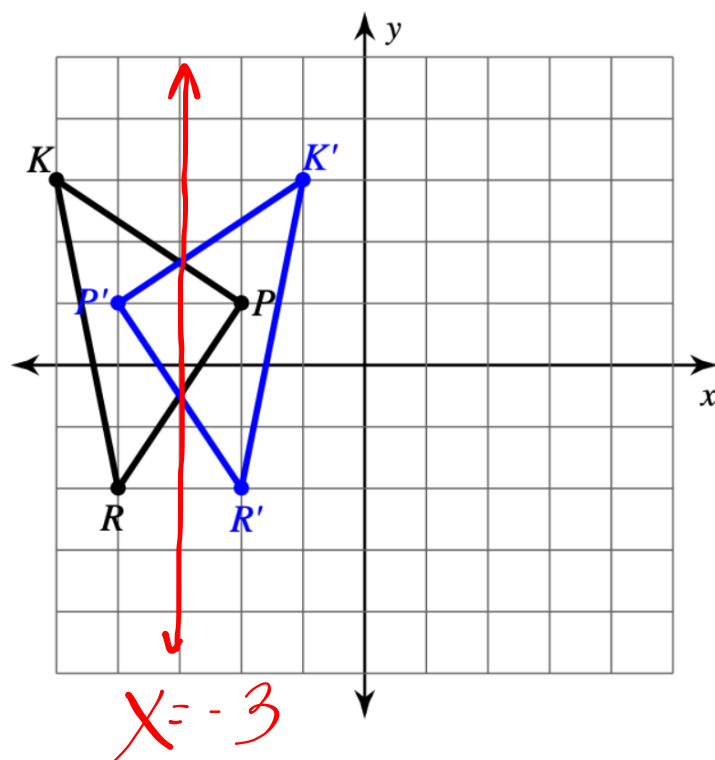
Write the reflections that must have occurred.

B.



Example 5:

Write the reflection that must have occurred.

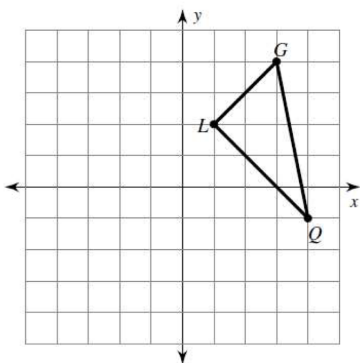


Reflections of Shapes

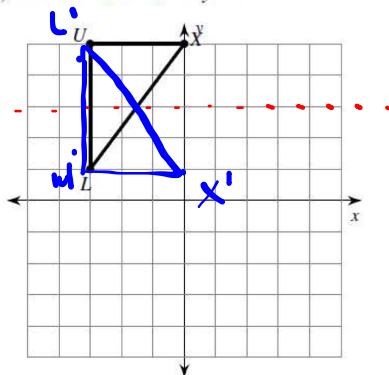
Date_____ Period_____

Graph the image of the figure using the transformation given.

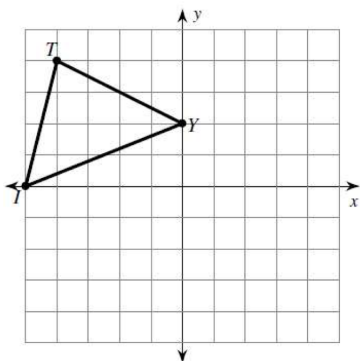
1) reflection across the x-axis



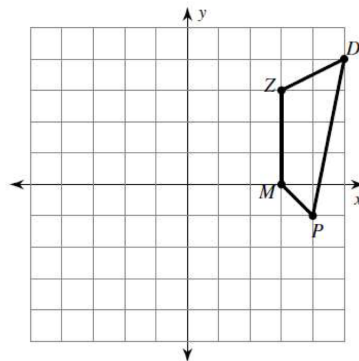
2) reflection across $y = 3$



3) reflection across $y = 1$

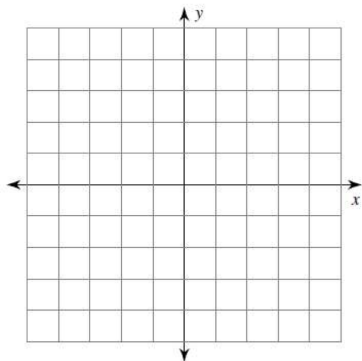


4) reflection across the x-axis



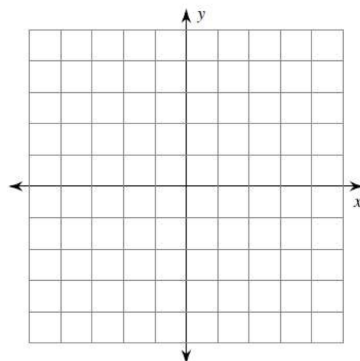
5) reflection across the x-axis

$T(2, 2)$, $C(2, 5)$, $Z(5, 4)$, $F(5, 0)$



6) reflection across $y = -2$

$H(-1, -5)$, $M(-1, -4)$, $B(1, -2)$, $C(3, -3)$



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

- 7) reflection across the x-axis
 $K(1, -1)$, $N(4, 0)$, $Q(4, -4)$

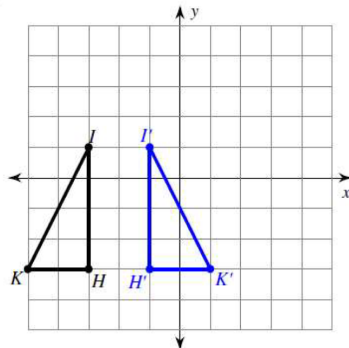
- 8) reflection across $y = -1$
 $R(-3, -5)$, $N(-4, 0)$, $V(-2, -1)$, $E(0, -4)$

- 9) reflection across $x = 3$
 $F(2, 2)$, $W(2, 5)$, $K(3, 2)$

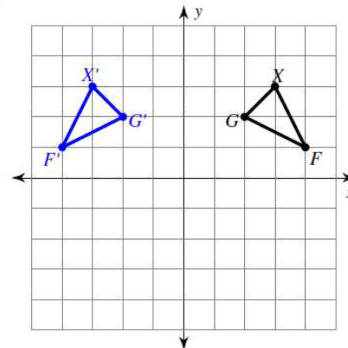
- 10) reflection across $x = -1$
 $V(-3, -1)$, $Z(-3, 2)$, $G(-1, 3)$, $M(1, 1)$

Write a rule to describe each transformation.

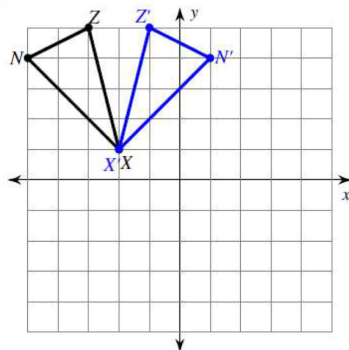
11)



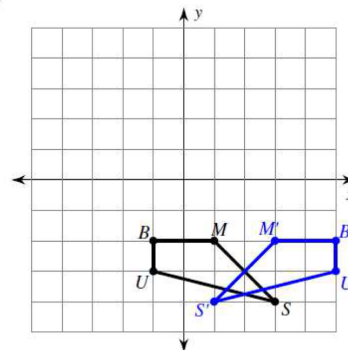
12)



13)



14)



Homework

Finish classwork