

Warm Up

4/10

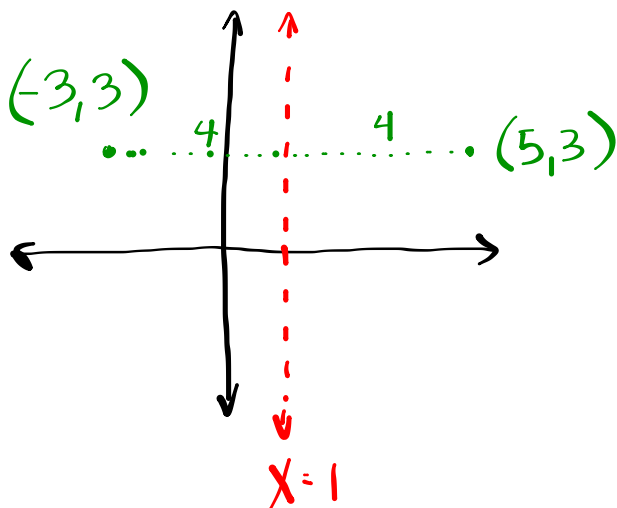
If a figure is reflected across the line $x = 1$,
would the image be

SIMILAR or CONGRUENT

to the pre-image?

How do you know?

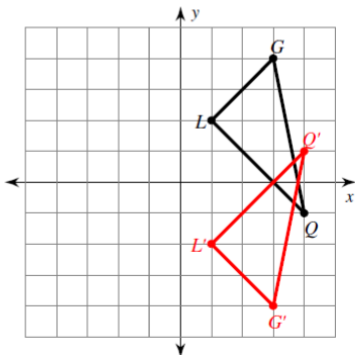
Where would point $(5,3)$ go?



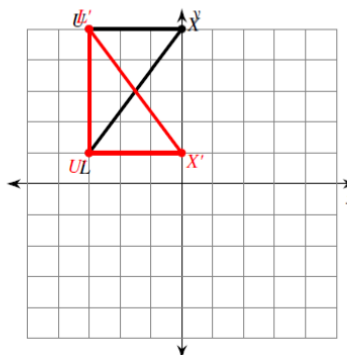
Reflections of Shapes

Graph the image of the figure using the transformation given.

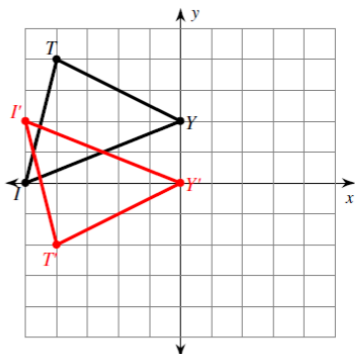
1) reflection across the x-axis



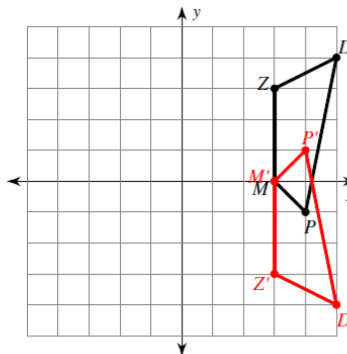
2) reflection across $y = 3$



3) reflection across $y = 1$

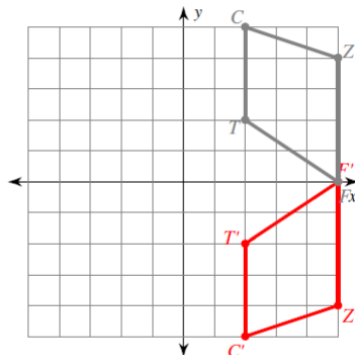


4) reflection across the x-axis



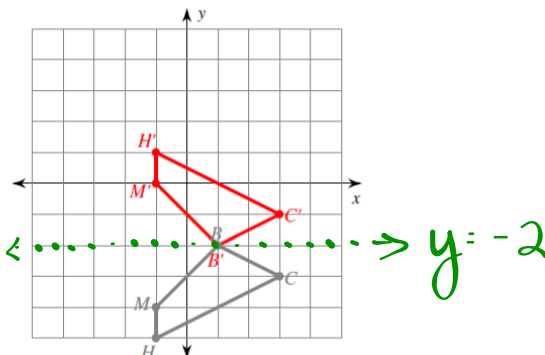
5) reflection across the x-axis

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



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
 $K(1, -1), N(4, 0), Q(4, -4)$

$N'(4, 0), Q'(4, 4), K'(1, 1)$

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

$N'(-4, -2), V'(-2, -1), E'(0, 2), R'(-3, 3)$

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

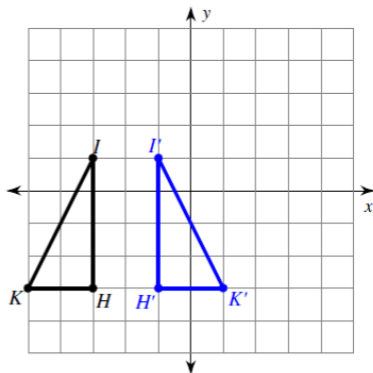
$W'(4, 5), K'(3, 2), F'(4, 2)$

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

$Z'(1, 2), G'(-1, 3), M'(-3, 1), V'(1, -1)$

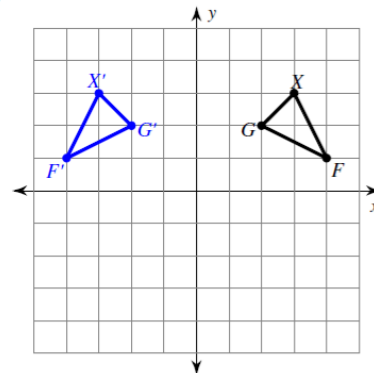
Write a rule to describe each transformation.

11)



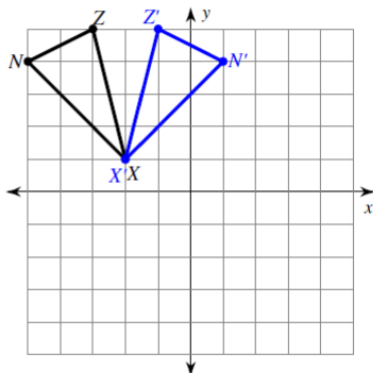
reflection across $x = -2$

12)



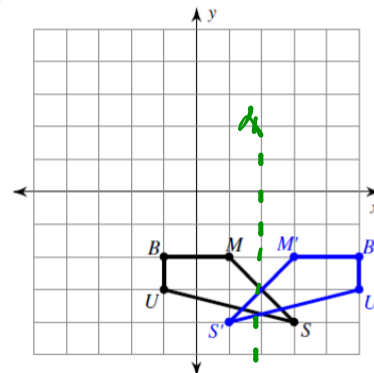
reflection across the y-axis

13)



reflection across $x = -2$

14)



reflection across $x = 2$

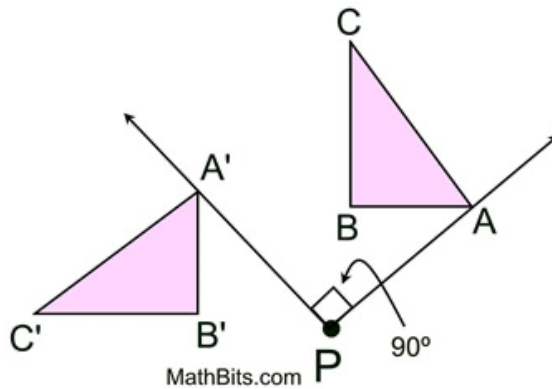
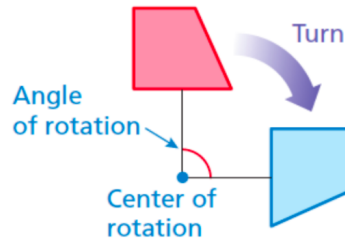
Rotations

Key Idea

Rotations

A **rotation**, or *turn*, is a transformation in which a figure is rotated about a point called the **center of rotation**. The number of degrees a figure rotates is the **angle of rotation**.

In a rotation, the original figure and its image are congruent.

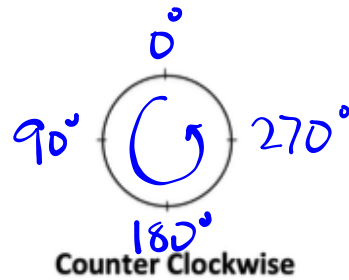
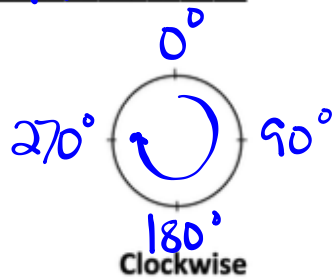


Rules for Rotation:

- Every point of the Image is rotated around the center
of rotation.
- Each point in the Image is rotated the same number
of degrees in the same direction.

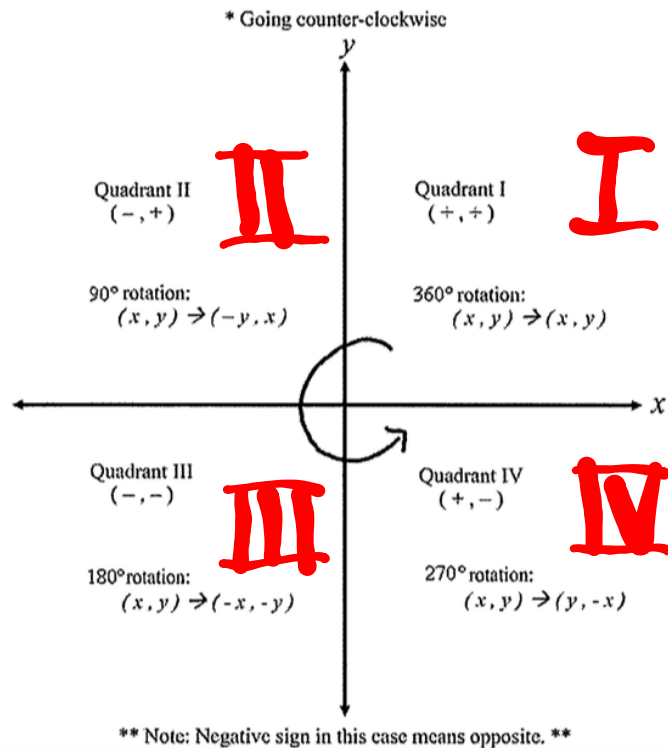
- Figures can be rotated clockwise or

counter clockwise.

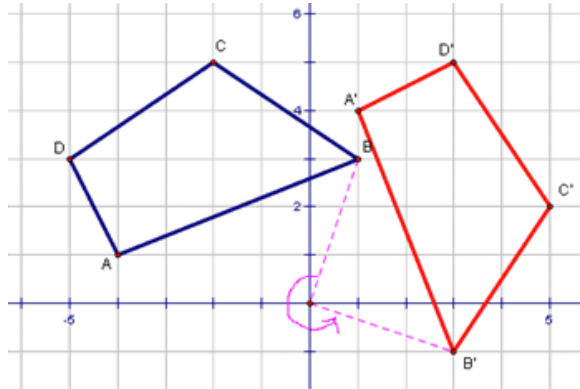


- The image and the preimage are congruent.

How to label Quadrants:



ROTATION

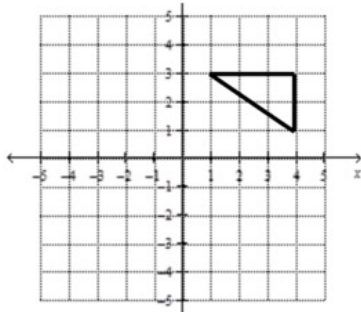


To rotate an object, we need to know:

1. The point we are rotating around
2. The direction we are rotating
3. The number of degrees we are rotating

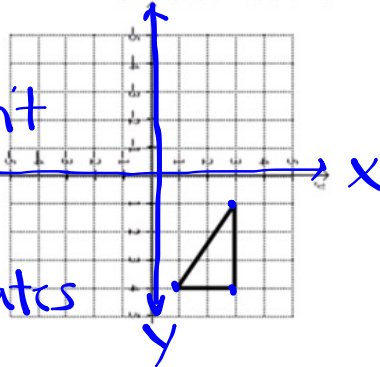
How to do it yourself:

Rotate 90° clockwise around the origin.

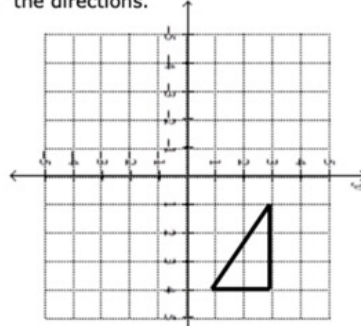


2 Write down the coordinates of the "new" figure as it looks. $(3, -1), (3, -4), (1, -4)$

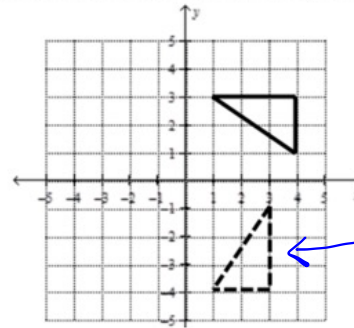
Pretend axes don't change when reading coordinates



1 Rotate your paper according to the directions.



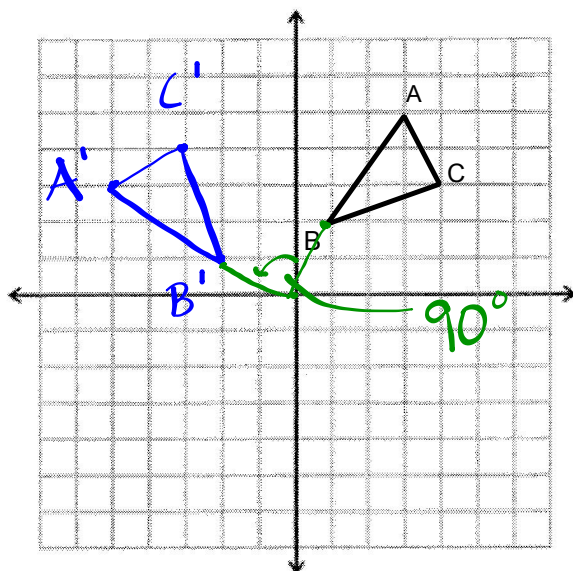
3 Turn your paper back and plot the points.



How to a draw rotated object

- Rotate the paper with the pre-image plotted the specified number of degrees in the correct direction.
- Write down the new coordinates of the "image".
- Rotate the paper back to the original orientation.
- Plot the coordinates of the image.

Rotate 90° counter clockwise around the origin.

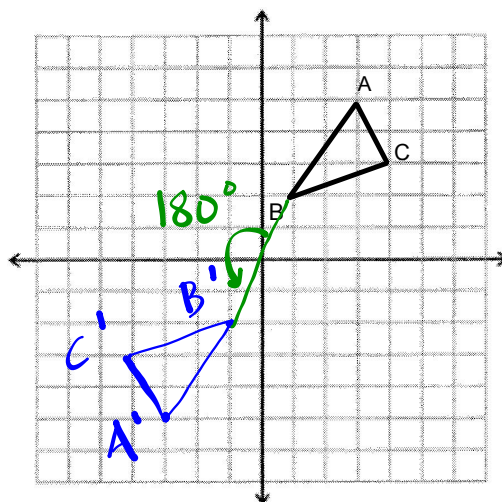


$$A(3, 5) \longrightarrow A'(-5, 3)$$

$$B(1, 2) \longrightarrow B'(-2, 1)$$

$$C(4, 3) \longrightarrow C'(-3, 4)$$

Rotate 180° counter clockwise around the origin.



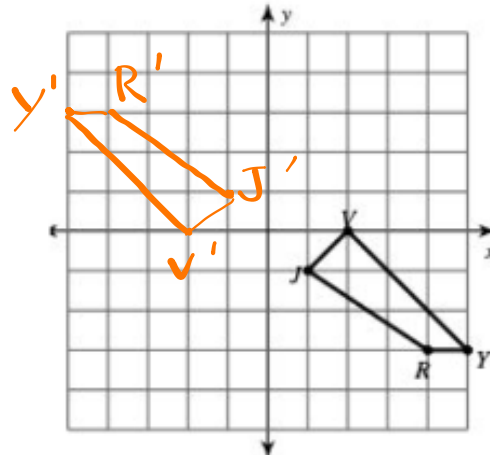
$$A(3, 5) \longrightarrow A'(-3, -5)$$

$$B(1, 2) \longrightarrow B'(-1, -2)$$

$$C(4, 3) \longrightarrow C'(-4, -3)$$

Example #2: rotate the given shape

) rotation 180° about the origin

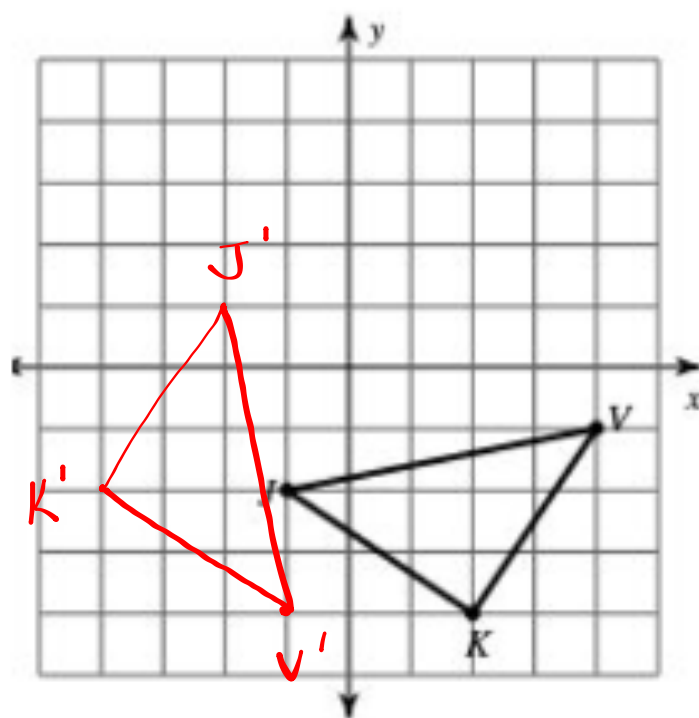


Why do you think there was no direction given for the rotation?

180° in either direction will get you to the same place.

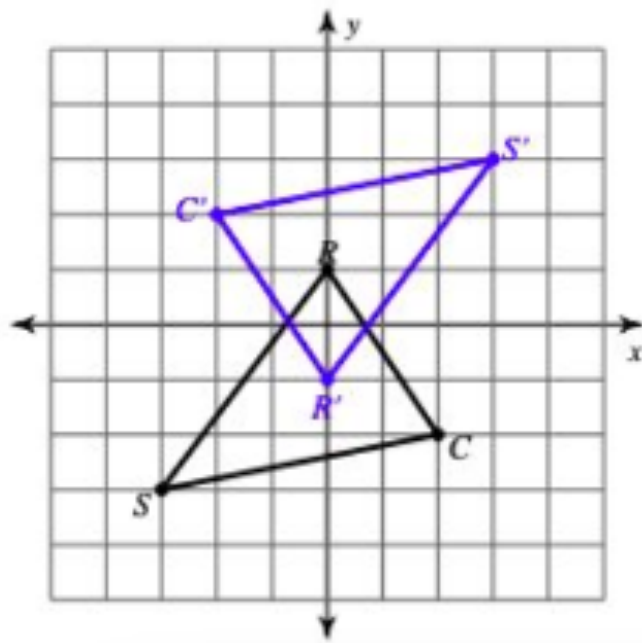
Example #3: rotate the given shape

↳ rotation 90° clockwise about the origin



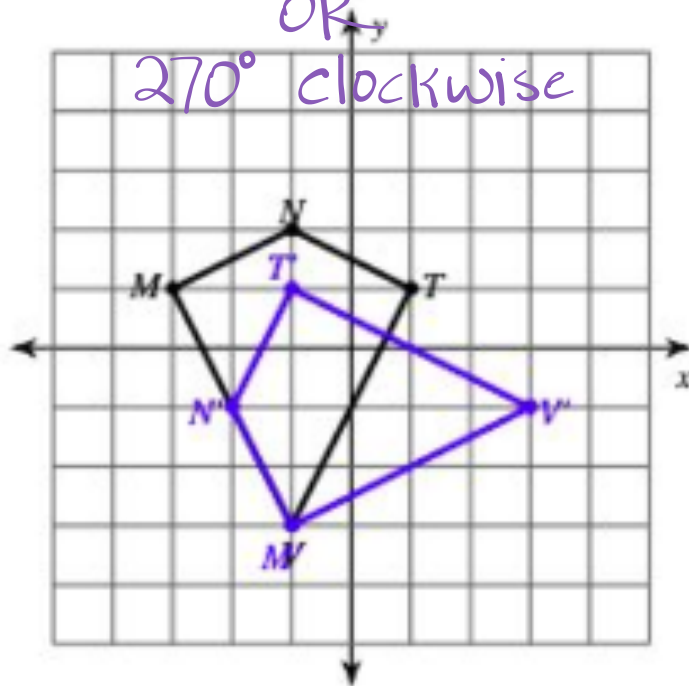
Example #4: write the rotation that must have occurred

180° either direction



Example #5: write the **TWO** rotations that could have occurred

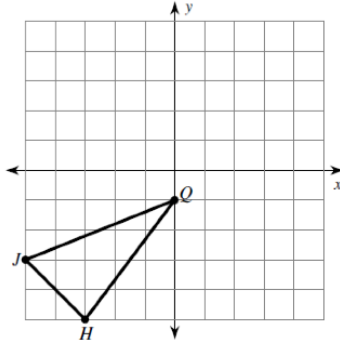
90° counter clockwise
OR
 270° clockwise



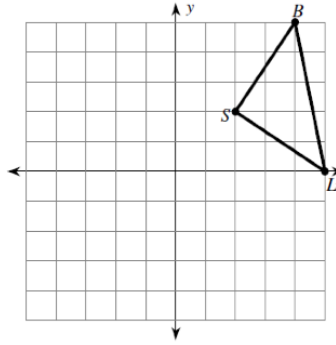
Rotations of Shapes

Graph the image of the figure using the transformation given.

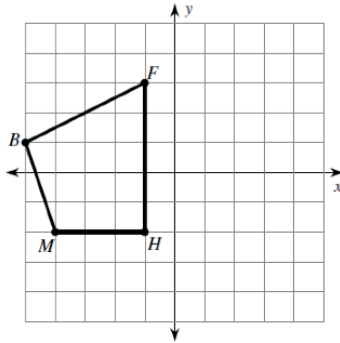
1) rotation 180° about the origin



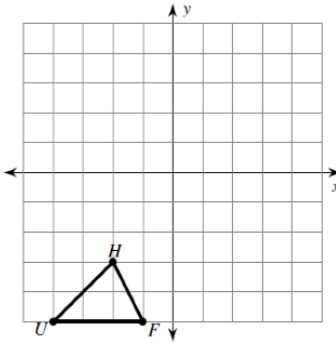
2) rotation 90° counterclockwise about the origin



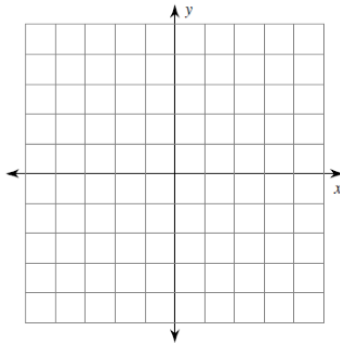
3) rotation 90° clockwise about the origin



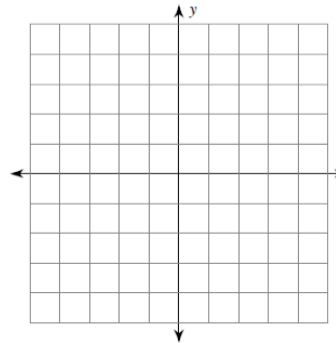
4) rotation 180° about the origin



5) rotation 90° clockwise about the origin
 $U(1, -2), W(0, 2), K(3, 2), G(3, -3)$



6) rotation 180° about the origin
 $V(2, 0), S(1, 3), G(5, 0)$



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

7) rotation 180° about the origin

$Z(-1, -5), K(-1, 0), C(1, 1), N(3, -2)$

8) rotation 180° about the origin

$L(1, 3), Z(5, 5), F(4, 2)$

9) rotation 90° clockwise about the origin

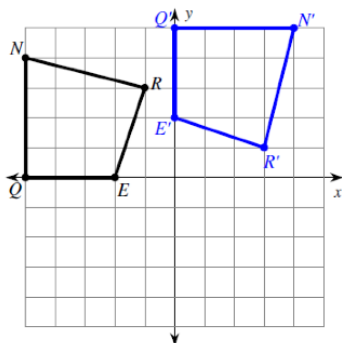
$S(1, -4), W(1, 0), J(3, -4)$

10) rotation 180° about the origin

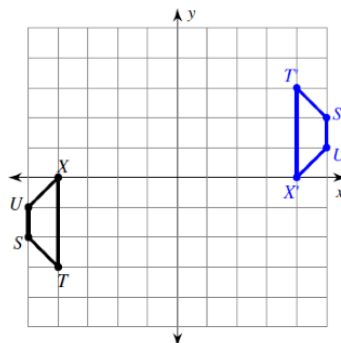
$V(-5, -3), A(-3, 1), G(0, -3)$

Write a rule to describe each transformation.

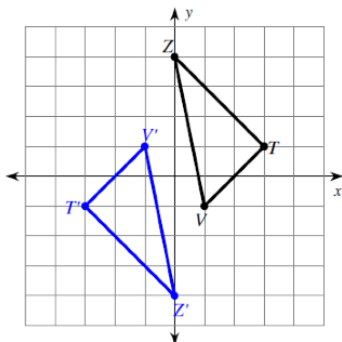
11)



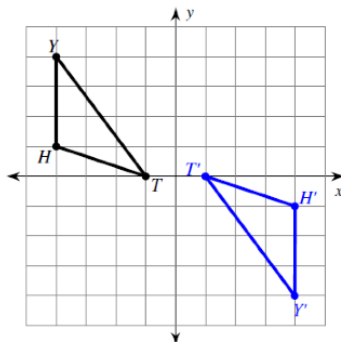
12)



13)



14)



Homework

Finish classwork