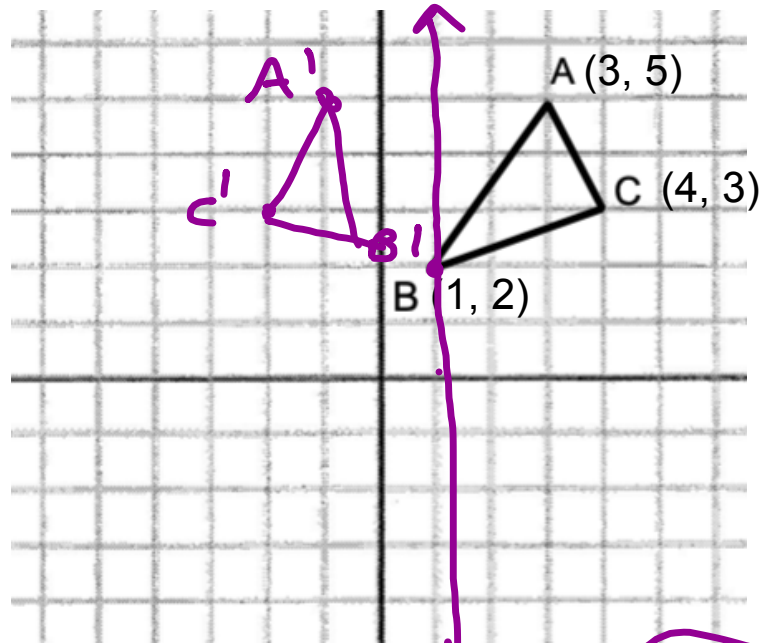


Warm Up

4/27

Reflect $\triangle ABC$ across the line $x = 1$.

Is the image? SIMILAR or **CONGRUENT**
to the pre-image?

How do you know?

How could you prove it?

Kuta Software - Infinite Pre-Algebra

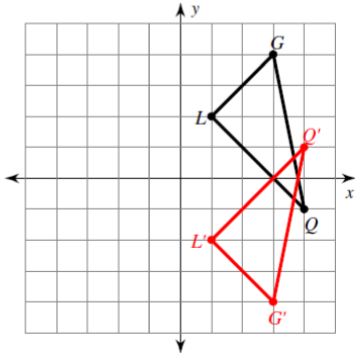
Name _____

Reflections of Shapes

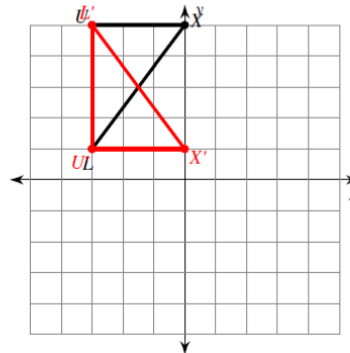
Date _____ Period _____

Graph the image of the figure using the transformation given.

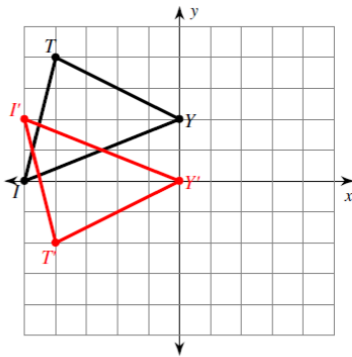
1) reflection across the x-axis



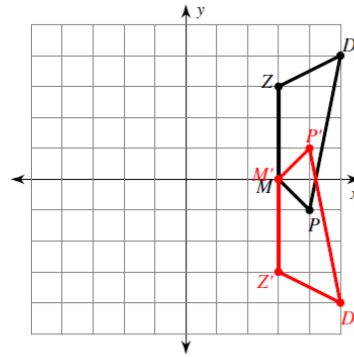
2) reflection across $y = 3$



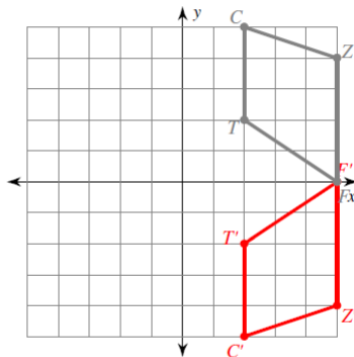
3) reflection across $y = 1$



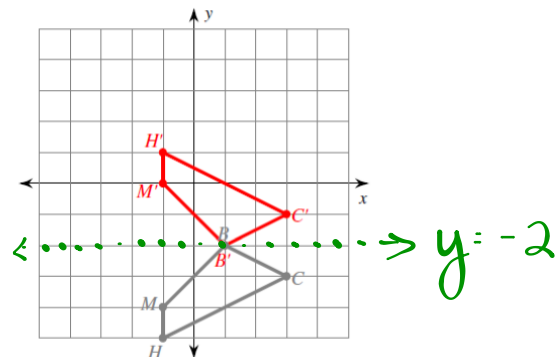
4) reflection across the x-axis



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

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

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

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 $x = 3$

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

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

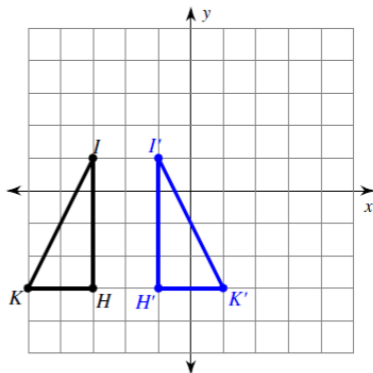
10) reflection across $x = -1$

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

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

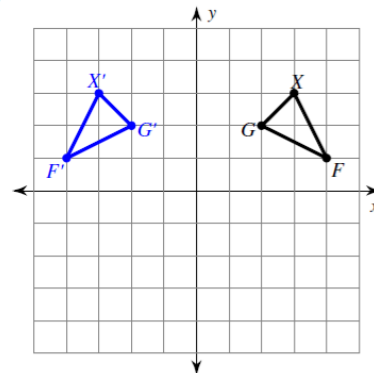
Write a rule to describe each transformation.

11)



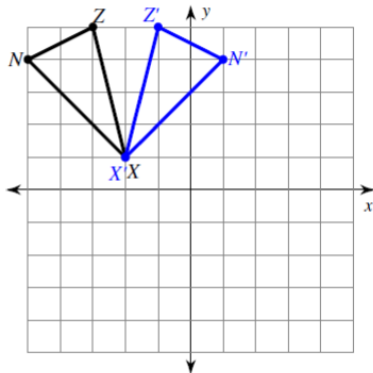
reflection across $x = -2$

12)



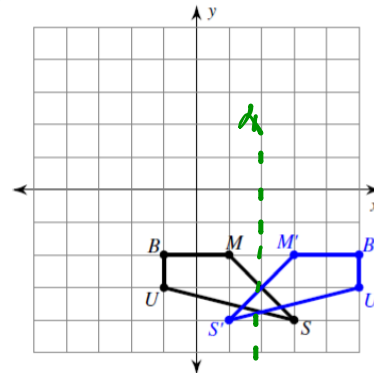
reflection across the y-axis

13)



reflection across $x = -2$

14)



reflection across $x = 2$

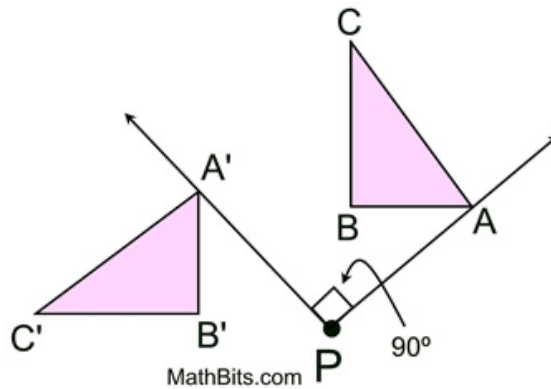
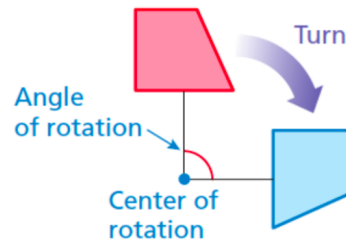
Rotations

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**.

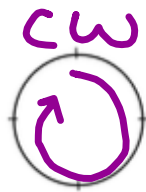
In a rotation, the original figure and its image are congruent.



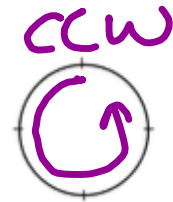
Rules for Rotation:

- 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 (CW) or counter clockwise (CCW).



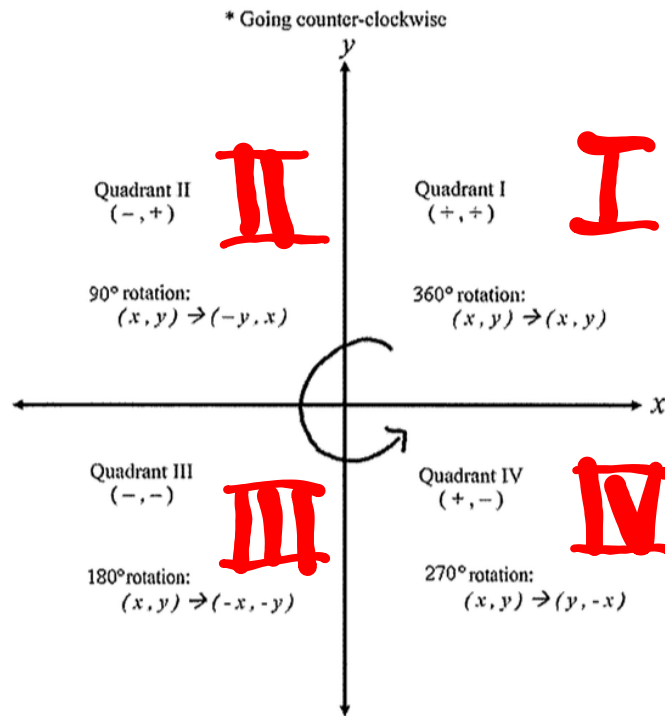
Clockwise



Counter Clockwise

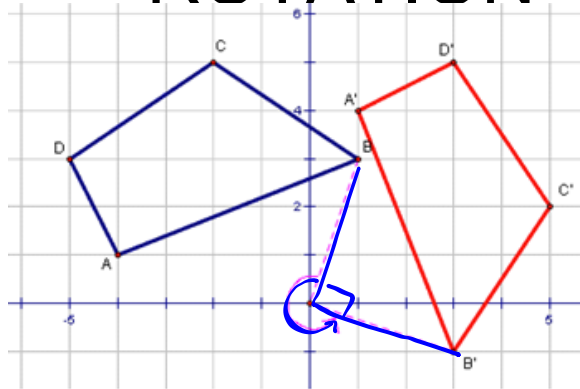
- The image and the preimage are congruent.

How to label Quadrants:



** Note: Negative sign in this case means opposite. **

ROTATION

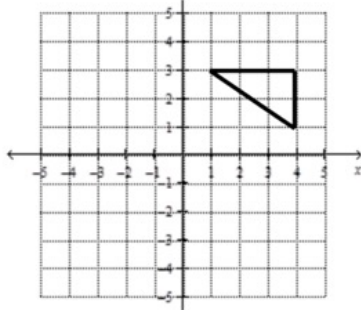


To rotate an object, we need to know:

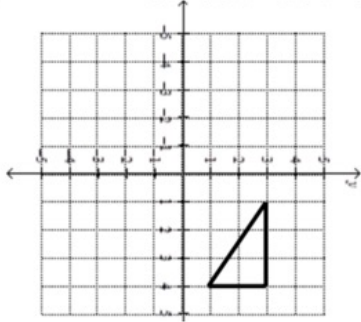
1. The point we are rotating around
2. The direction we are rotating
3. The number of degrees we are rotating

How to do it yourself:

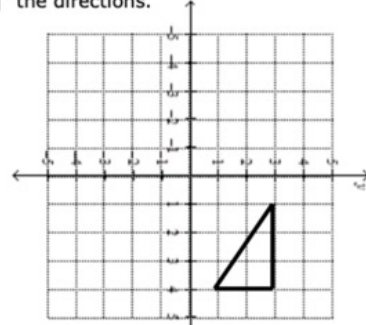
Rotate 90° clockwise around the origin.



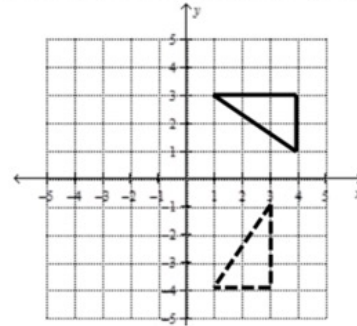
2 Write down the coordinates of the "new" figure as it looks. $(3, -1)$, $(3, -4)$, $(1, -4)$



1 Rotate your paper according to the directions.

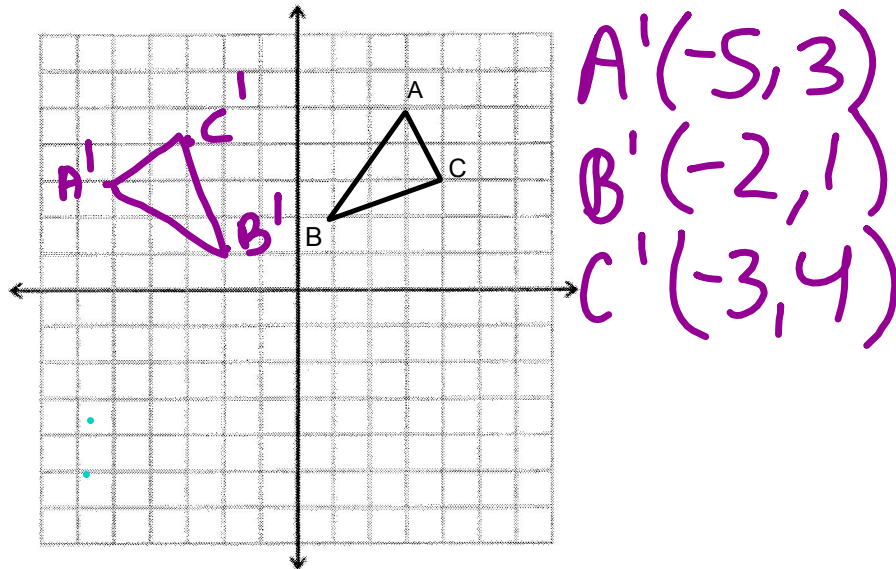


3 Turn your paper back and plot the points.



Let's Practice .

Rotate 90° counter clockwise around the origin.



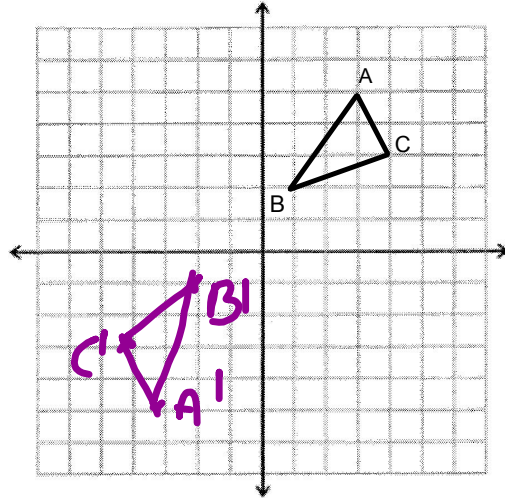
$$A(3, 5) \longrightarrow A'(\quad, \quad)$$

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

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

Rotate 180° counter clockwise around the origin.

$$\begin{aligned} A(3,5) &\rightarrow A'(-3,-5) \\ B(1,2) &\rightarrow B'(-2,-1) \\ C(4,3) &\rightarrow C'(-4,-3) \end{aligned}$$



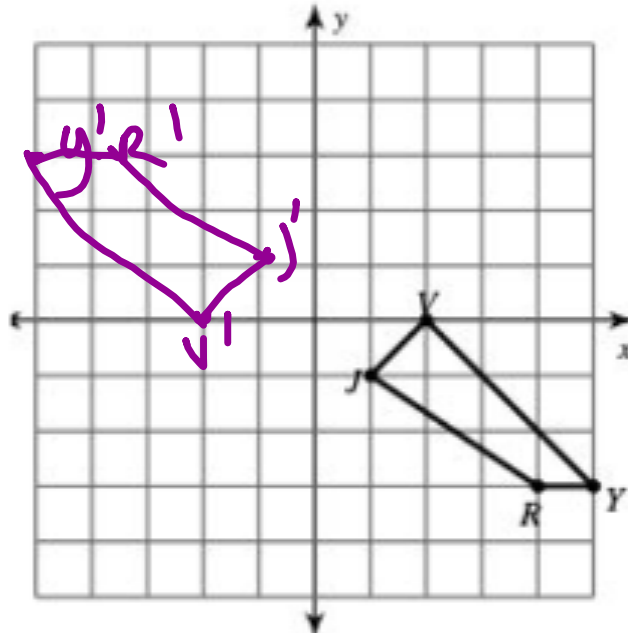
How to a draw rotated object

- 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.

Example #2: rotate the given shape

1) rotation 180° about the origin

$Y'(-5, 3)$
 $R'(-4, 3)$
 $J'(-1, 1)$
 $V'(-2, 0)$

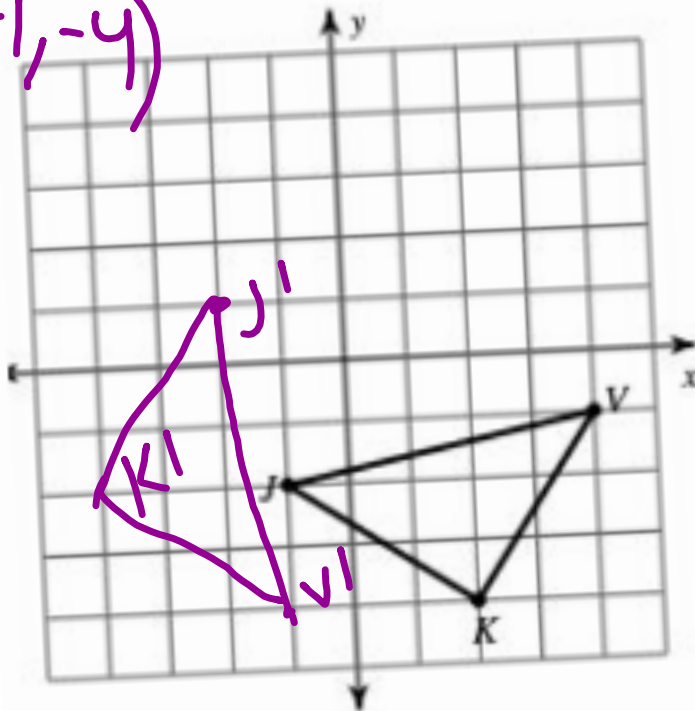


Why do you think there was no direction given for the rotation?

$$J'(-2, 1)$$
$$K'(-4, -2)$$
$$V'(-1, -4)$$

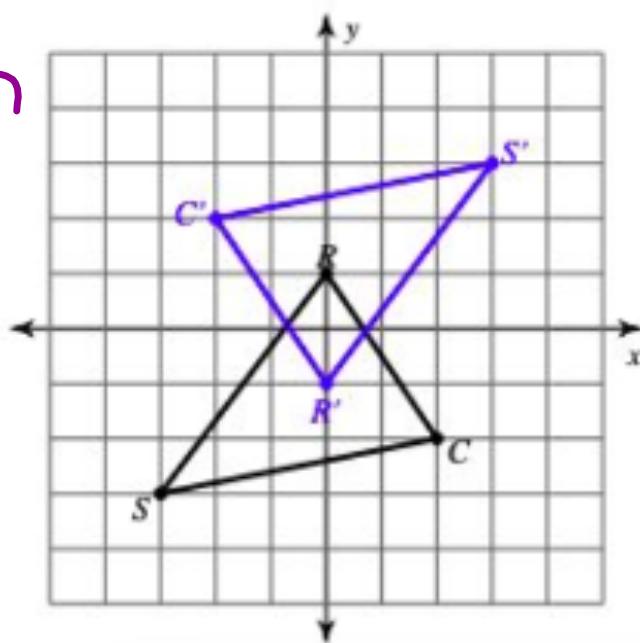
Example #3: rotate the given shape

rotation 90° clockwise about the origin



180°
CW
around
the
origin

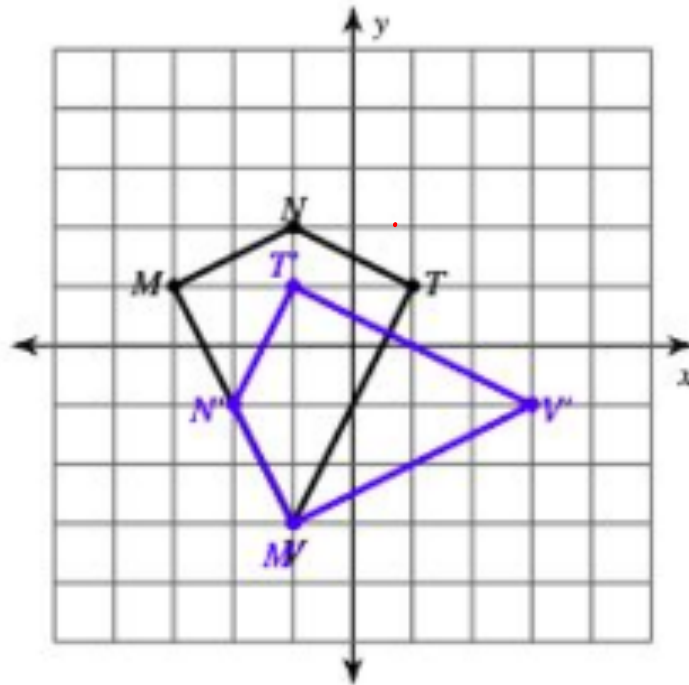
Example #4: write the rotation that must have occurred



90°
CCW
around
the
origin

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

270°
CW
around
the
origin

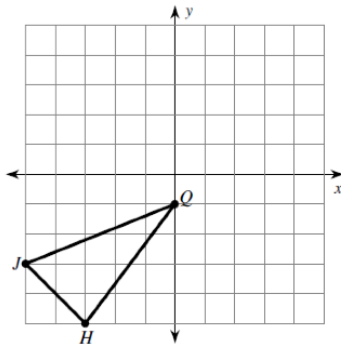


Rotations of Shapes

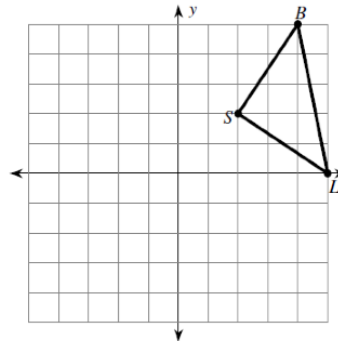
Date _____ Period _____

Graph the image of the figure using the transformation given.

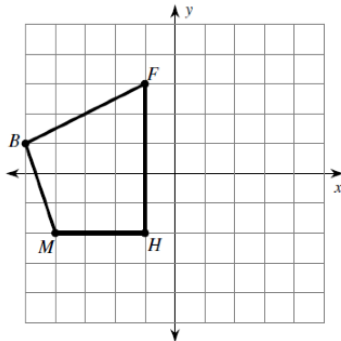
- 1) rotation
- 180°
- about the origin



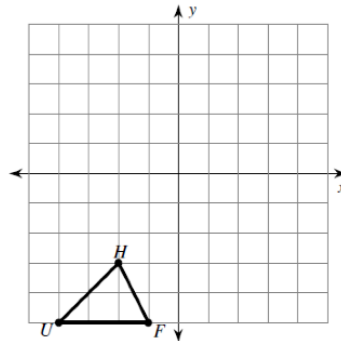
- 2) rotation
- 90°
- counterclockwise about the origin



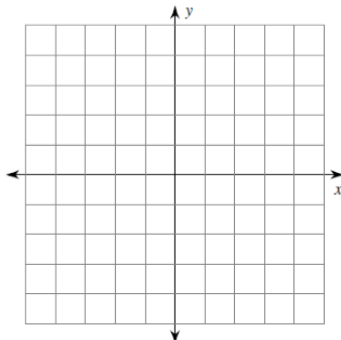
- 3) rotation
- 90°
- clockwise about the origin



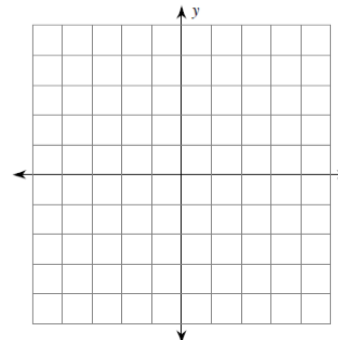
- 4) rotation
- 180°
- about the origin



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

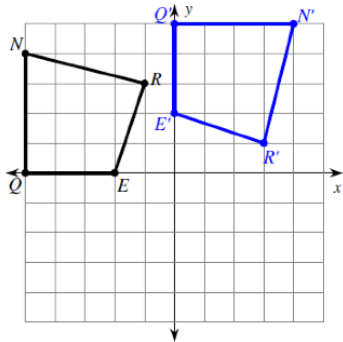
- 8) rotation 180° about the origin
 $L(1, 3)$, $Z(5, 5)$, $F(4, 2)$

- 9) rotation 90° clockwise about the origin
 $S(1, -4)$, $W(1, 0)$, $J(3, -4)$

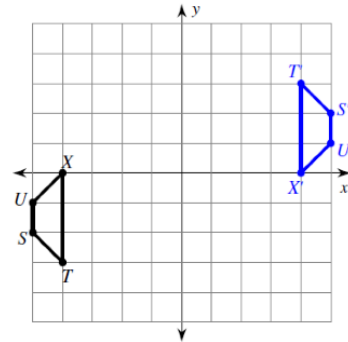
- 10) rotation 180° about the origin
 $V(-5, -3)$, $A(-3, 1)$, $G(0, -3)$

Write a rule to describe each transformation.

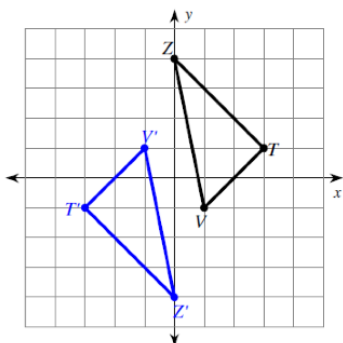
11)



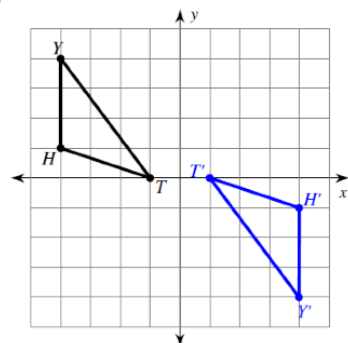
12)



13)



14)



Homework

Finish classwork