Warm Up

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?

Every point of the image is the same distance from the line of reflection as the preimage, but on the other side.

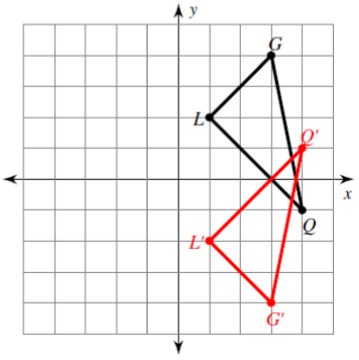
Kuta Software - Infinite Pre-Algebra Name_____

Reflections of Shapes

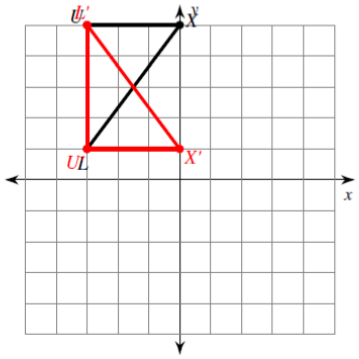
Date_____ Period____

Graph the image of the figure using the transformation given.

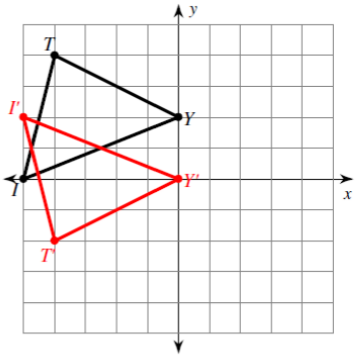
1) reflection across the x-axis



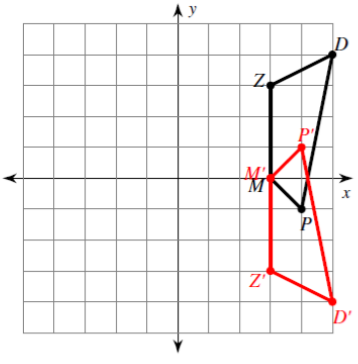
2) reflection across $y = 3$



3) reflection across $y = 1$

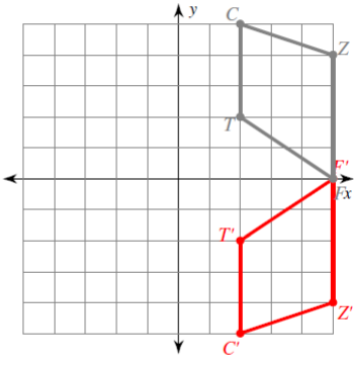


4) reflection across the x-axis



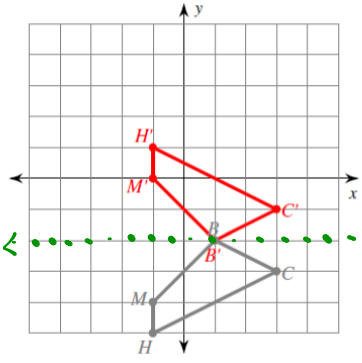
5) reflection across the x-axis

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



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

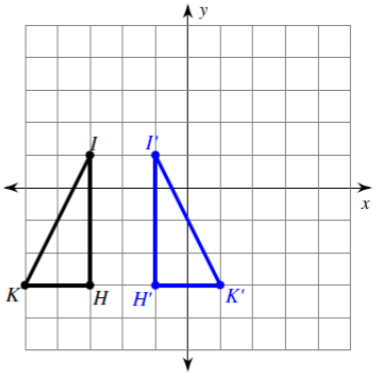
$W'(4, 5)$, $K'(3, 2)$, $F'(4, 2)$

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

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

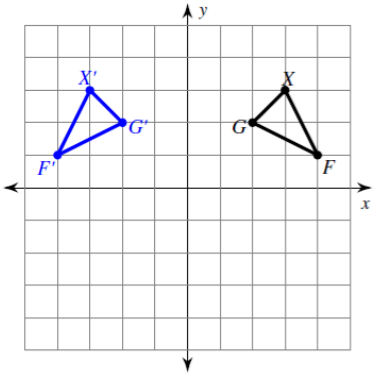
Write a rule to describe each transformation.

11)



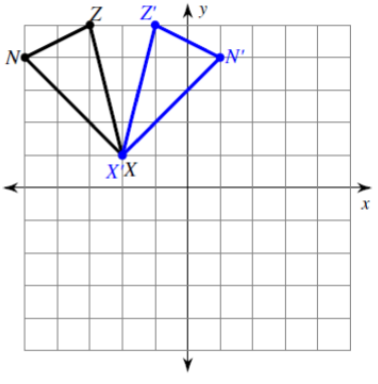
reflection across $x = -2$

12)



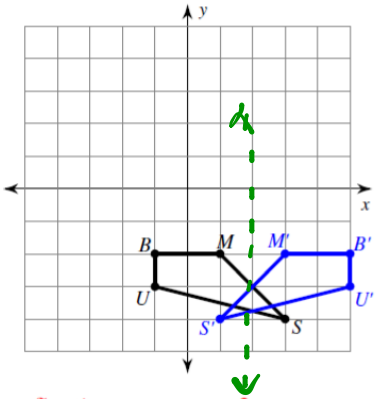
reflection across the y-axis

13)



reflection across $x = -2$

14)



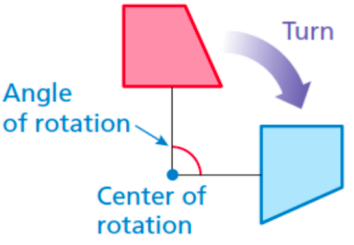
reflection across $x = 2$

Rotations

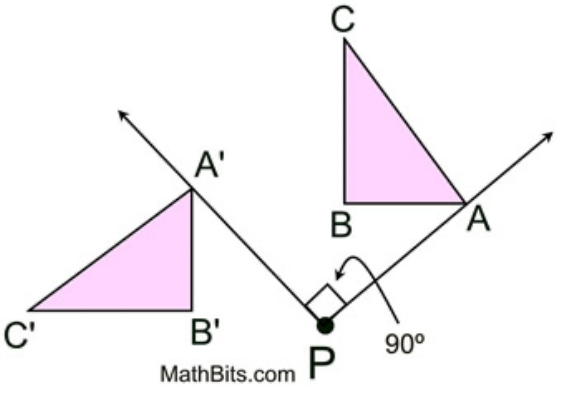
Key Idea

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**.



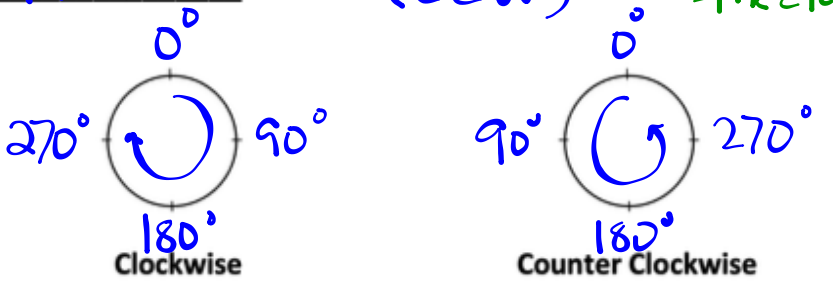
In a rotation, the original figure and its image are congruent.



Rules for Rotation:

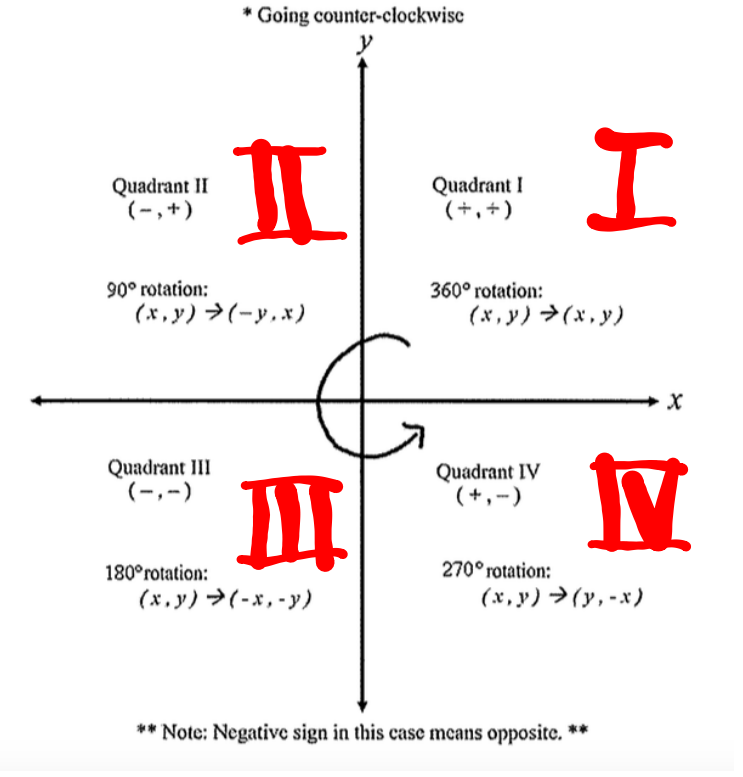
- Every point of the Image is rotated around the center or point of rotation.
- Each point in the Image is rotated the same number of degrees in the same direction.

- Figures can be rotated _____clockwise (CW)_____ or _____counter_____ clockwise.(CCW)
  - clockwise: the way the hands of the clock move

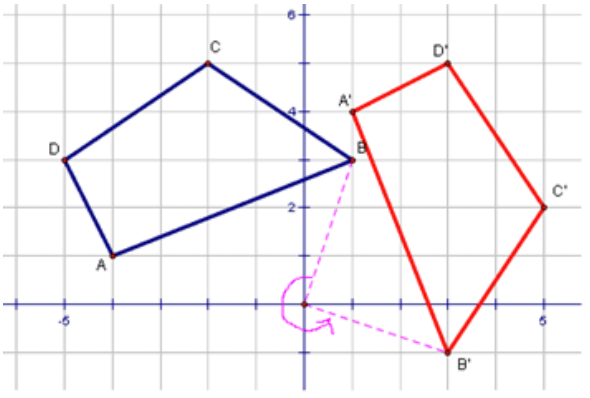


- The image and the preimage are _____congruent_____.

How to label Quadrants:



ROTATION

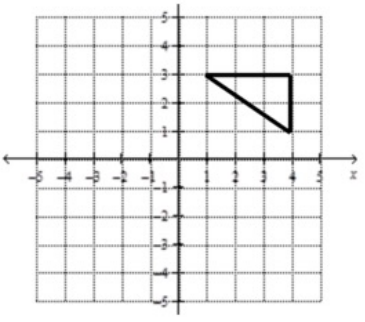


To rotate an object, we need to know:

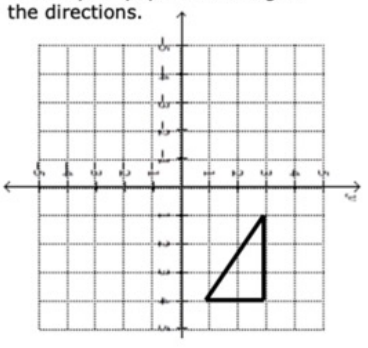
1. The point we are rotating around
2. The direction we are rotating
3. The number of degrees we are rotating

How to do it yourself:

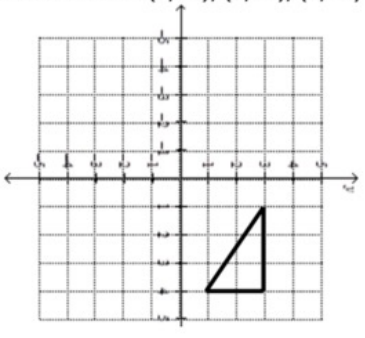
Rotate 90° clockwise around the origin.



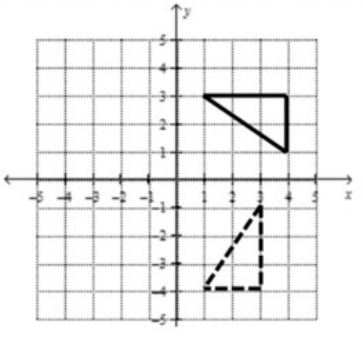
1 Rotate your paper according to the directions.



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



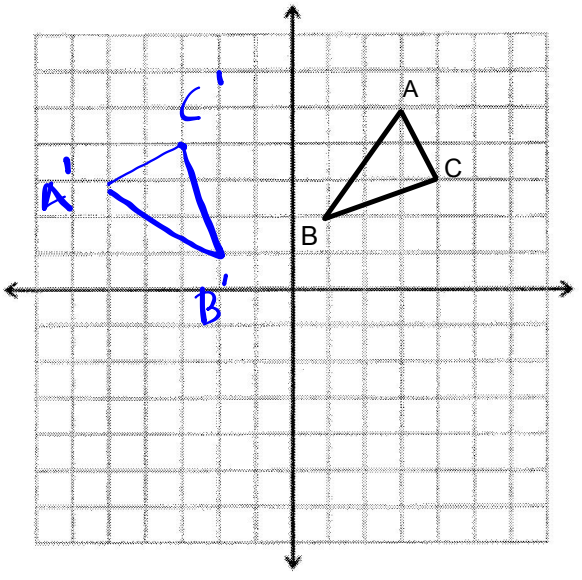
3 Turn your paper back and plot the points.



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.



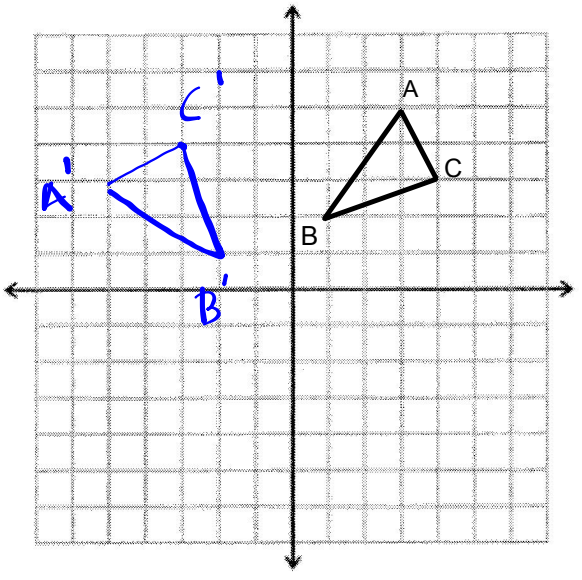
A'(-5,3)
B'(-2,1)
C'(-3,4)

A (3, 5) ⟶ A' (-5 , 3)

B (1, 2) ⟶ B' (-2 , 1)

C (4, 3) ⟶ C' (-3 , 4)

Rotate 90° counter clockwise around the origin.



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

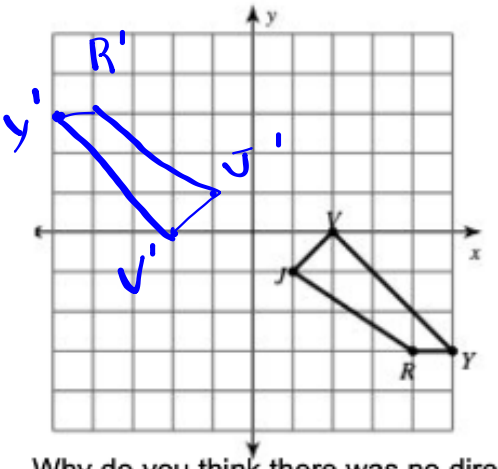
A (3, 5) ⟶ A' (-5 , 3)

B (1, 2) ⟶ B' (-2 , 1)

C (4, 3) ⟶ C' (-3 , 4)

Example #2: rotate the given shape

) rotation 180° about the origin



V'(-2,0)

Y'(-5,3)

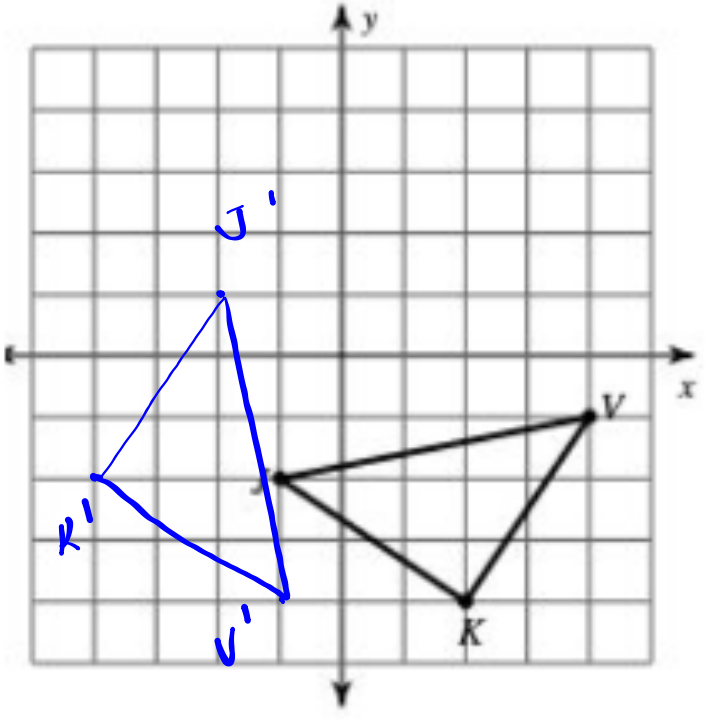
R'(-4,3)

J'(-1,1)

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

Example #3: rotate the given shape

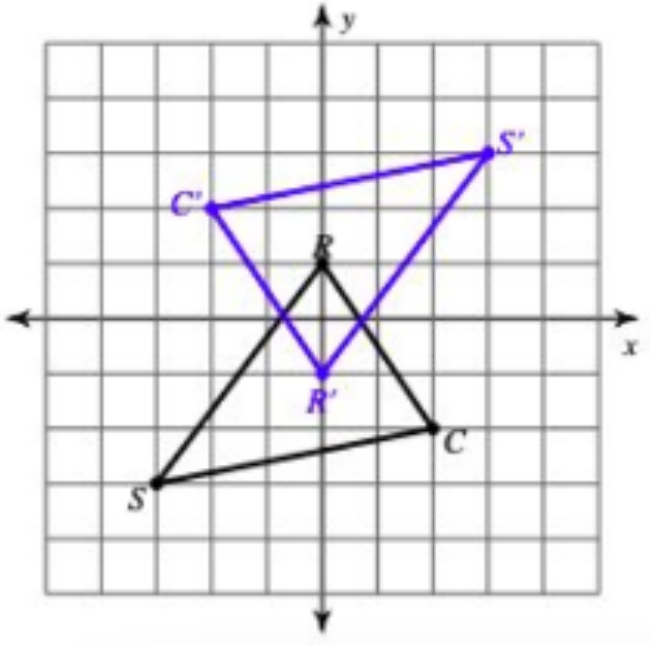
rotation 90° clockwise about the origin



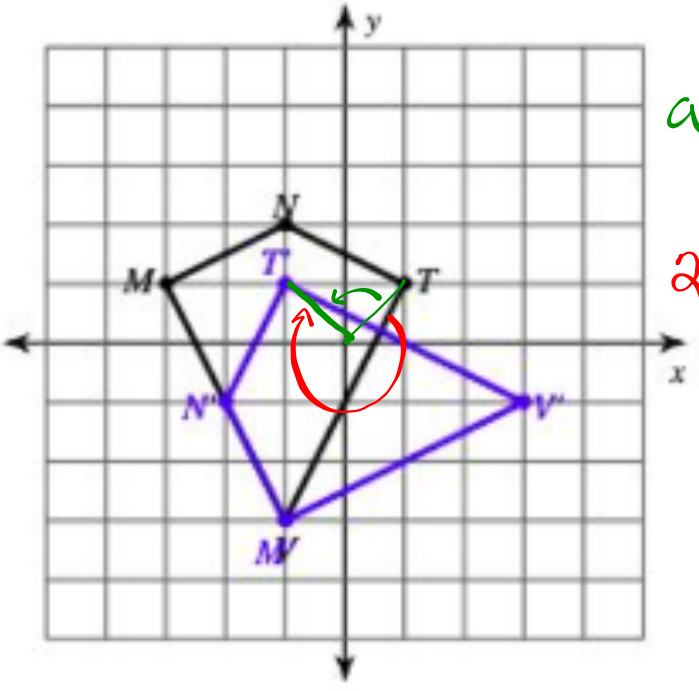
J'(-2,1)
V'(-1,-4)
K'(-4,-2)

Example #4: write the rotation that must have occurred

180° around the origin



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



90° counterclockwise
CCW
around origin

270° CW

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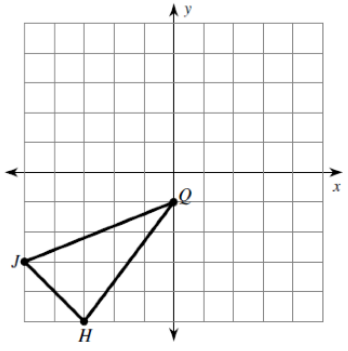
Rotations of Shapes

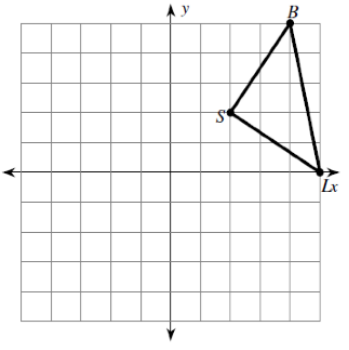
Date_____ Period____

Graph the image of the figure using the transformation given.

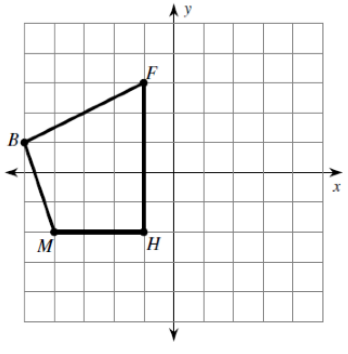
1) rotation 180° about the origin



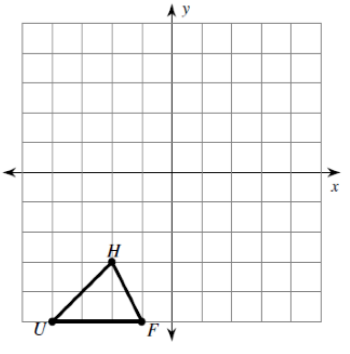
2) rotation 90° counterclockwise about the origin



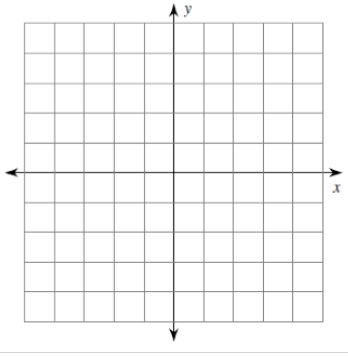
3) rotation 90° clockwise about the origin



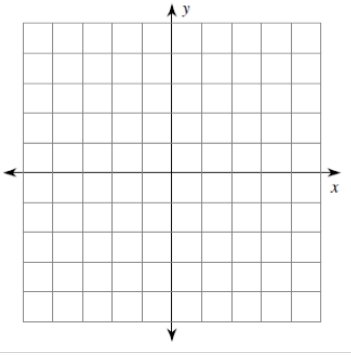
4) rotation 180° about the origin



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

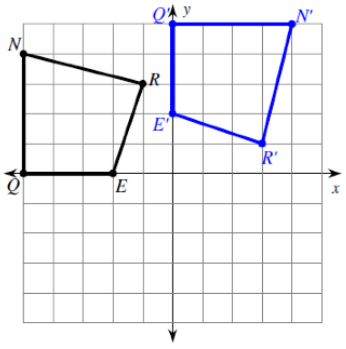
8) rotation 180° about the origin
$L(1, 3)$, $Z(5, 5)$, $F(4, 2)$

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

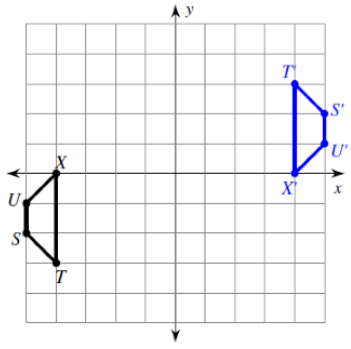
10) rotation 180° about the origin
$V(-5, -3)$, $A(-3, 1)$, $G(0, -3)$

Write a rule to describe each transformation.

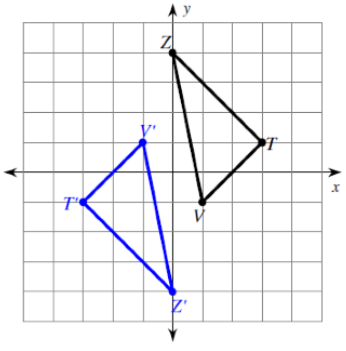
11)



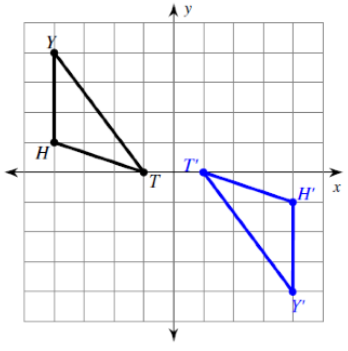
12)



13)



14)



Homework

Finish classwork