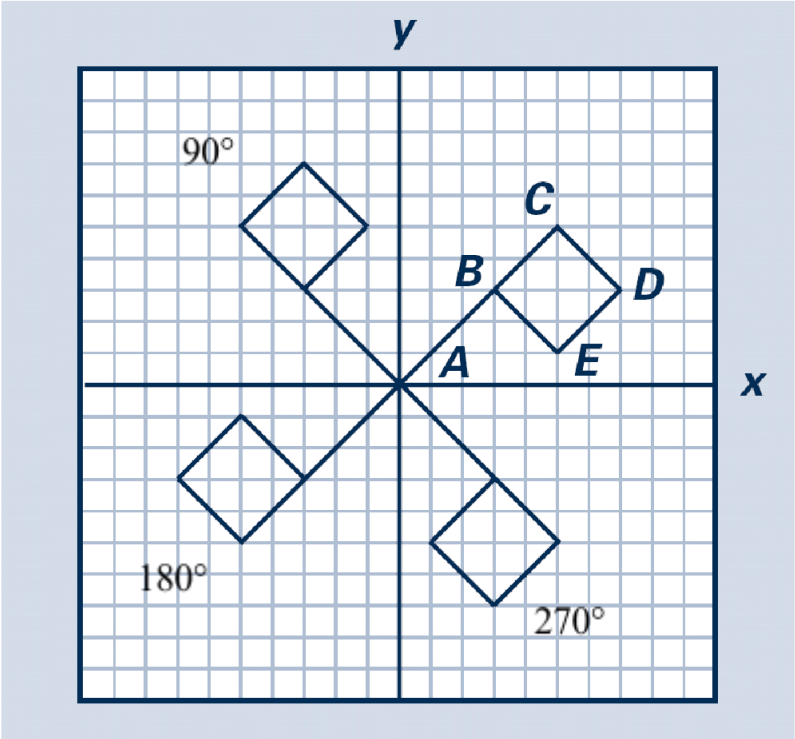
Rotations in the Coordinate Plane

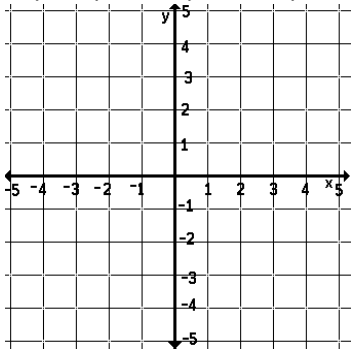


Center of Rotation = Origin (0,0)

Pre-Image	90° Counterclockwise Rotation Image	180° Counterclockwise Rotation Image	270° Counterclockwise Rotation Image
A(0,0)			
B(3,3)			
C(5,5)			
D(7,3)			
E(5,1)			
(a,b)			

1. Rotate the following points 90° counterclockwise about the origin on the coordinate plane below.

a.) A(-2,-5) →A′(,)

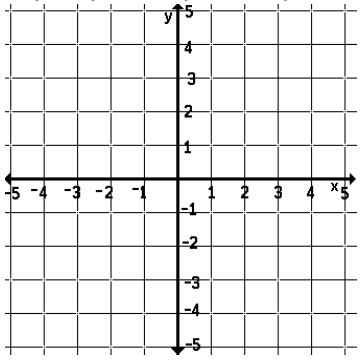


b.) A(-4,1) A′(,)

c.) In the graphs above connect the pre-image point A to the origin. Then connect the origin to the image point A′. What angle has been formed?

2. Rotate the following points 180°.

a.) B(-2,-5) →B′(,)

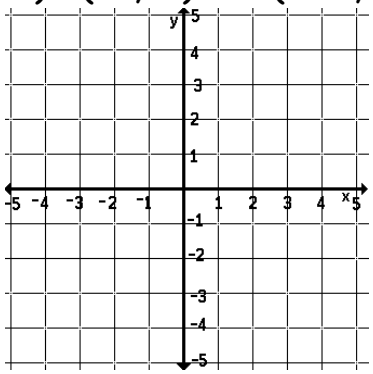


b.) B(-4,1) B′(,)

c.) In the graphs above connect the pre-image point B to the origin. Then connect the origin to the image point B′. What angle has been formed?

3. Rotate the following points 270° counterclockwise.

a.) $C(-2,-5) \rightarrow C'(\quad , \quad)$

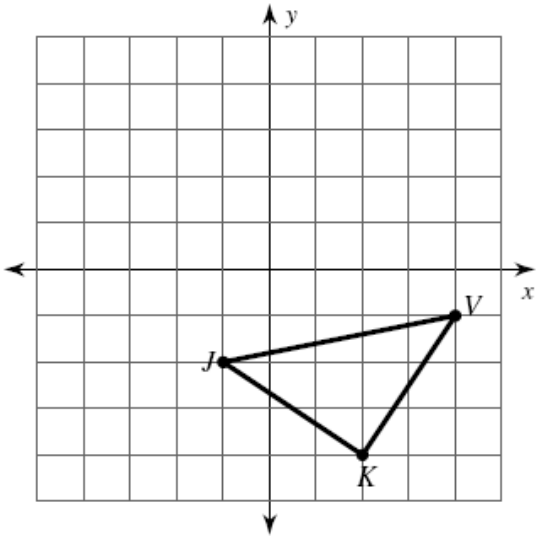


b.) $C(-4,1)\ C'(\quad , \quad)$

c.) In the graphs above connect the pre-image point C to the origin. Then connect the origin to the image point C'. What angle has been formed?

d.) A 270° counterclockwise angle is the same as a _____ clockwise angle.

4. Rotate the following figure 90° counterclockwise. Write the pre-image and image points in the spaces provided.

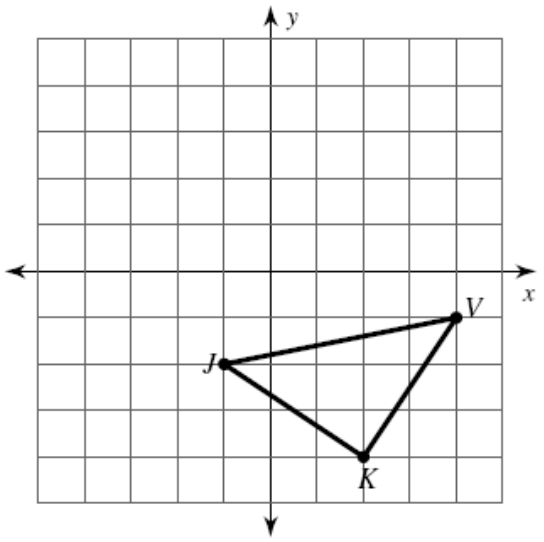


J(-1,-2)→ J'(,)

K(,)→ K'(,)

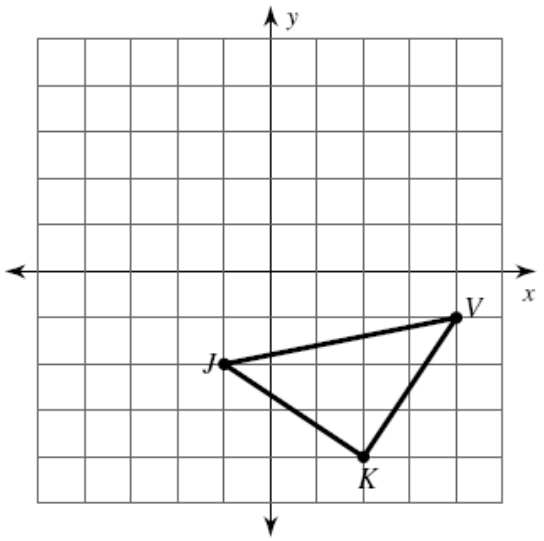
V(,)→ V'(,)

5. Rotate the following figure 180°. Write the pre-image and image points in the spaces provided.



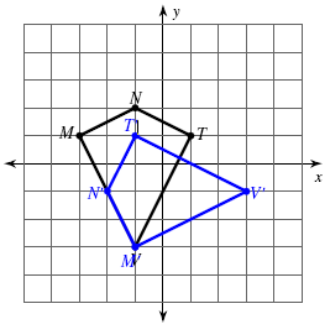
J(-1,-2)→ J′(,)
K(,)→ K′(,)
V(,)→ V′(,)

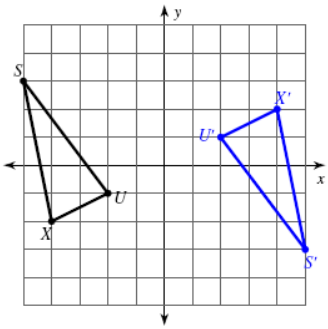
6. Rotate the following figure 270° counterclockwise. Write the pre-image and image points in the spaces provided.

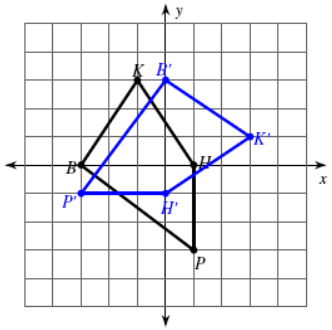


J(-1,-2)→ J′(,)
K(,)→ K′(,)
V(,)→ V′(,)

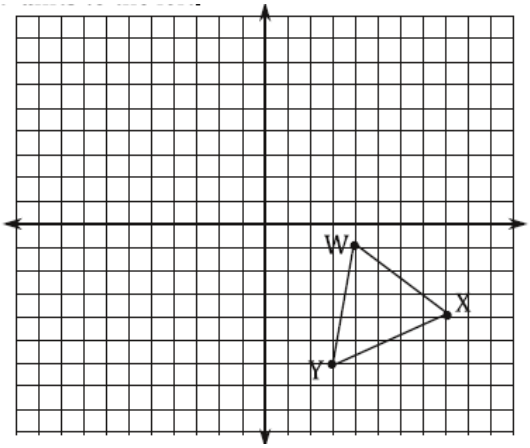
7. In each of the three graphs below determine how many degrees the shape has been rotated around the origin. (Remember in math everything is counterclockwise.)





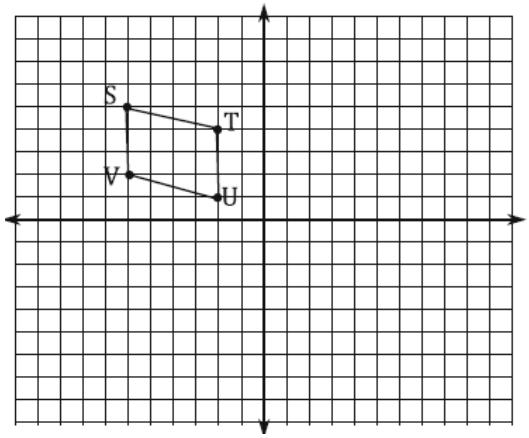


8. Rotate 90°.



W(,) W'(,)
X (,) X'(,)
Y (,) Y'(,)

9. Rotate the shape 180°. Then translate the new image 3 left and 1 down.



S(,) S'(,)
T(,) T' (,)
U(,) U' (,)
V(,) V' (,)

Shade in the final image and label using triple prime notation.

Write the rule for just the translation:

Let's Summarize!

Transformation	**Coordinate Rule**	**Example**
Translation	$(x,y)\rightarrow(x + h, y + k)$ h & k are integers	$(x, y)\rightarrow(x + 3, y - 1)$ $(5, -2)\rightarrow(8,-3)$
Reflection across x-axis	$(x,y)\rightarrow(\quad,\quad)$	$(5,-2)\rightarrow(\quad,\quad)$
Reflection across y-axis	$(x,y)\rightarrow(\quad,\quad)$	$(5,-2)\rightarrow(\quad,\quad)$
Reflection across line y=x	$(x,y)\rightarrow(\quad,\quad)$	$(5,-2)\rightarrow(\quad,\quad)$
Reflections across line y=-x	$(x,y)\rightarrow(\quad,\quad)$	$(5,-2)\rightarrow(\quad,\quad)$
90°cc rotation	$(x,y)\rightarrow(\quad,\quad)$	$(5,-2)\rightarrow(\quad,\quad)$
180° rotations	$(x,y)\rightarrow(\quad,\quad)$	$(5,-2)\rightarrow(\quad,\quad)$
270° cc rotation	$(x,y)\rightarrow(\quad,\quad)$	$(5,-2)\rightarrow(\quad,\quad)$