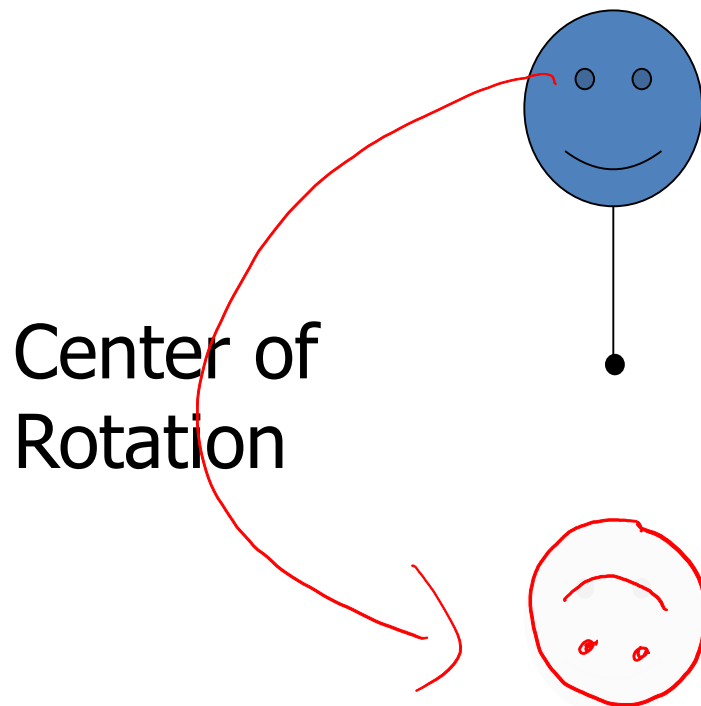


Rotation

- A transformation in which a figure is turned about a fixed point, called the center of rotation.



A Rotation is an Isometry

- **Segment lengths are preserved.**
- **Angle measures are preserved.**
- **Parallel lines remain parallel.**
- **Orientation is unchanged.**

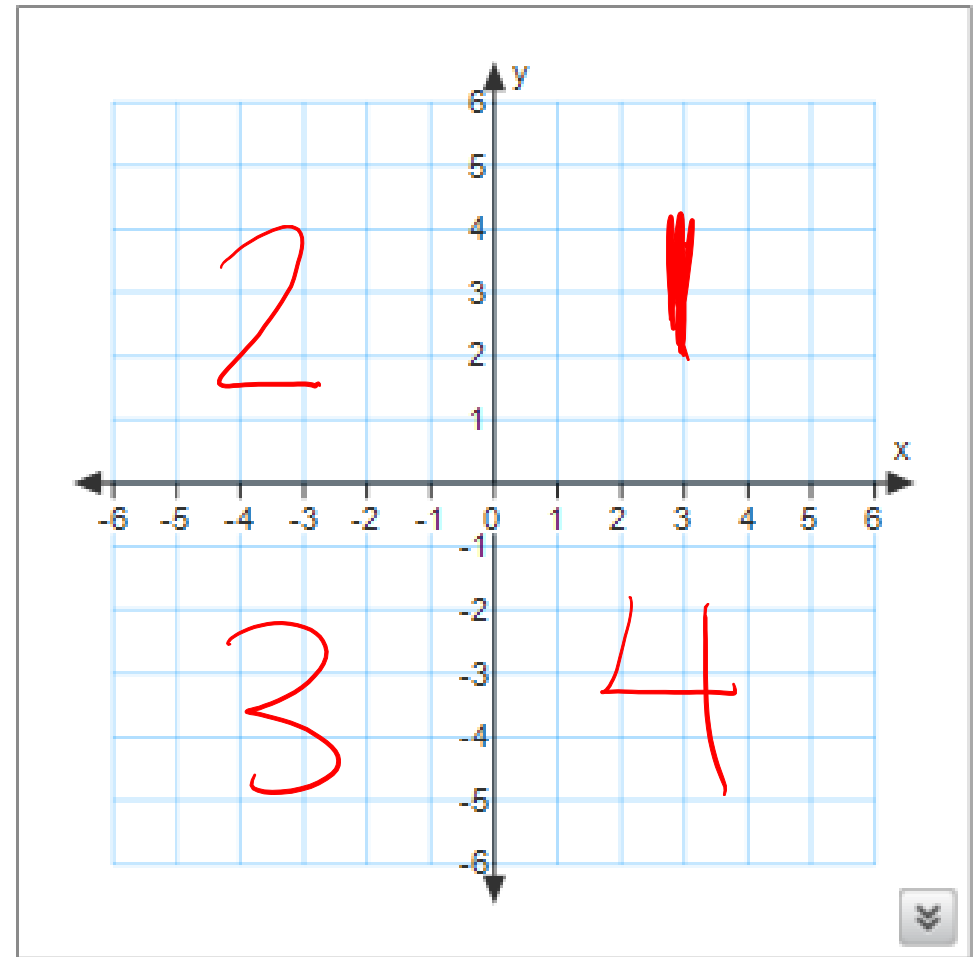
Day 4 - Rotations

Rotations are always

COUNTERCLOCKWISE



Quadrants - Quad means _____



**Discovery
Investigation!**

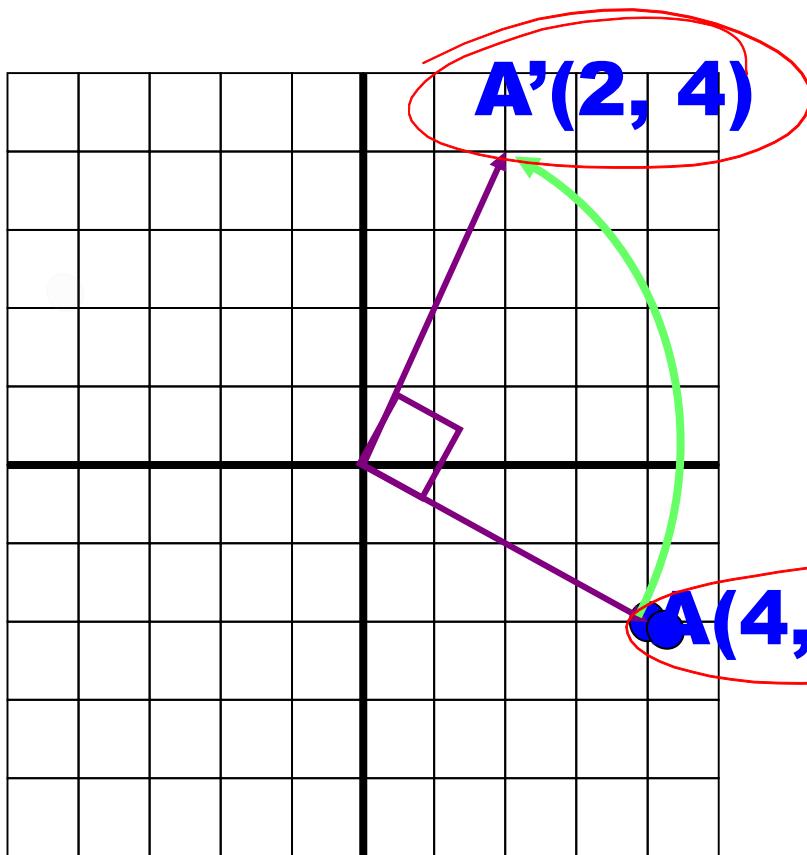
90° counter-clockwise rotation

Formula

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

$$A(4, -2)$$

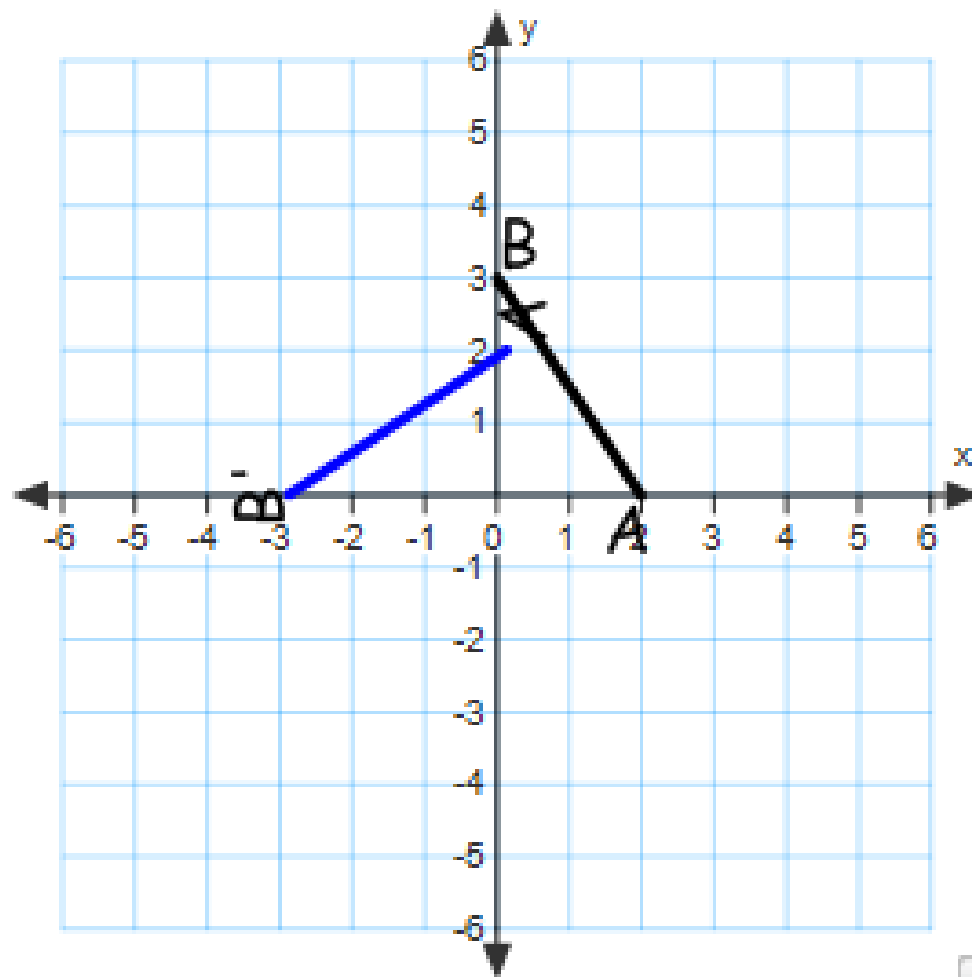
$$A'(2, 4)$$



90° Rotation:

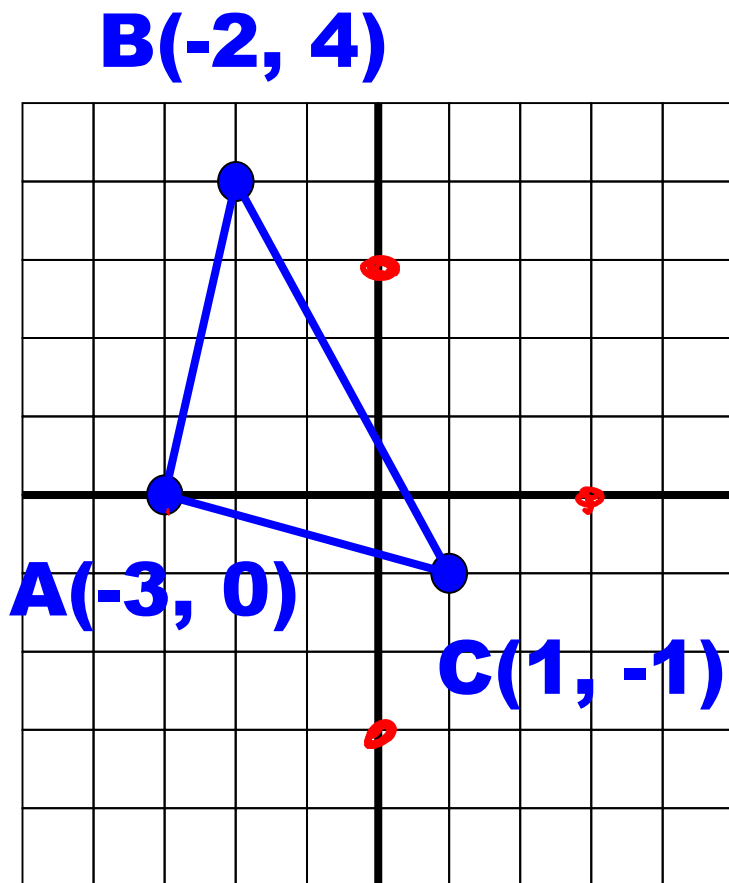
$A(2,0)$ $A'(0,2)$

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



Rotation Example

Draw a coordinate grid and graph:



A(-3, 0) $A'(0, 3)$

B(-2, 4)

C(1, -1)

Draw $\triangle ABC$

Rotate $\triangle ABC$

clockwise.

Formula

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

counter

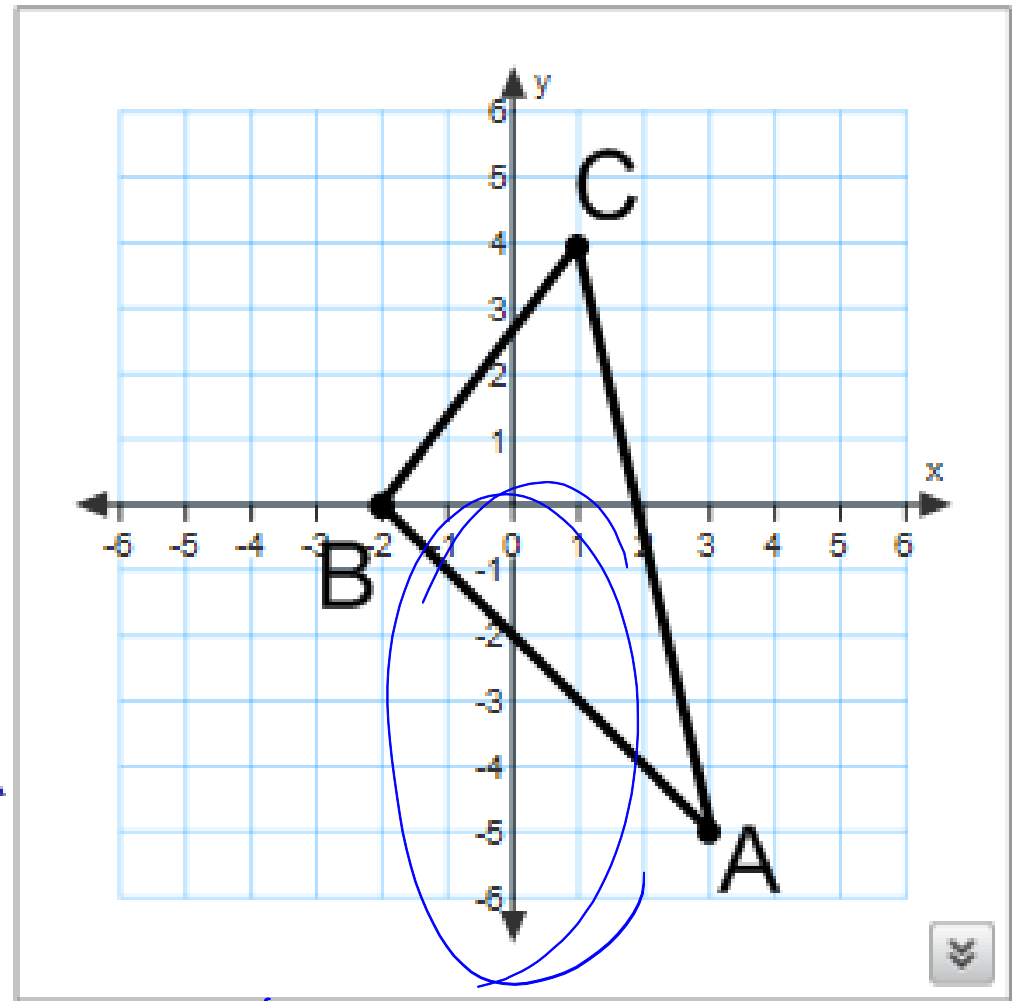
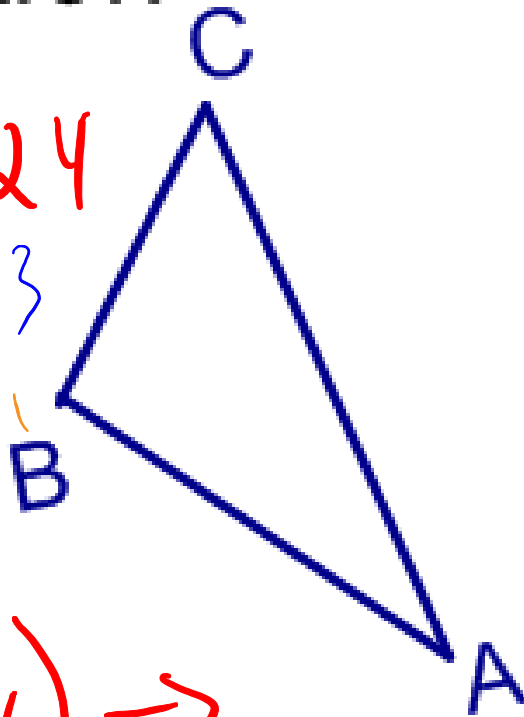
270°

90° Rotation

A(3,-5) Q4

B(-2,0) Q3

C(1,4) Q1



Rule: (x,y) →

Q1
A' (5, 3)

Q3, 4
B' (0, -2)

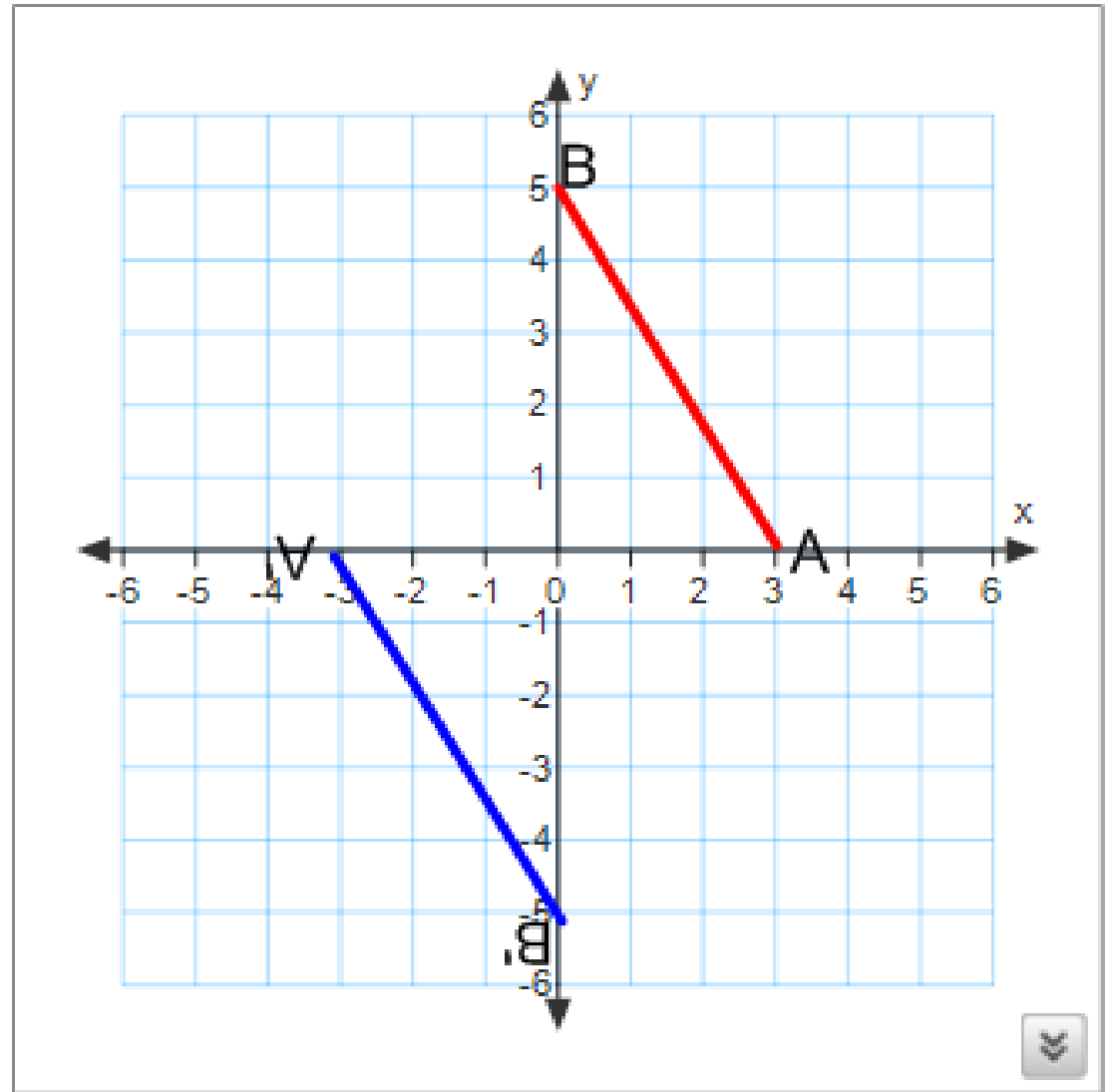
Q2
C' (-4, 1)

180° Counterclockwise rotation

$A(3,0)$ $A'(-3,0)$

$B(0,5)$ $B'(0,-5)$

(x,y)

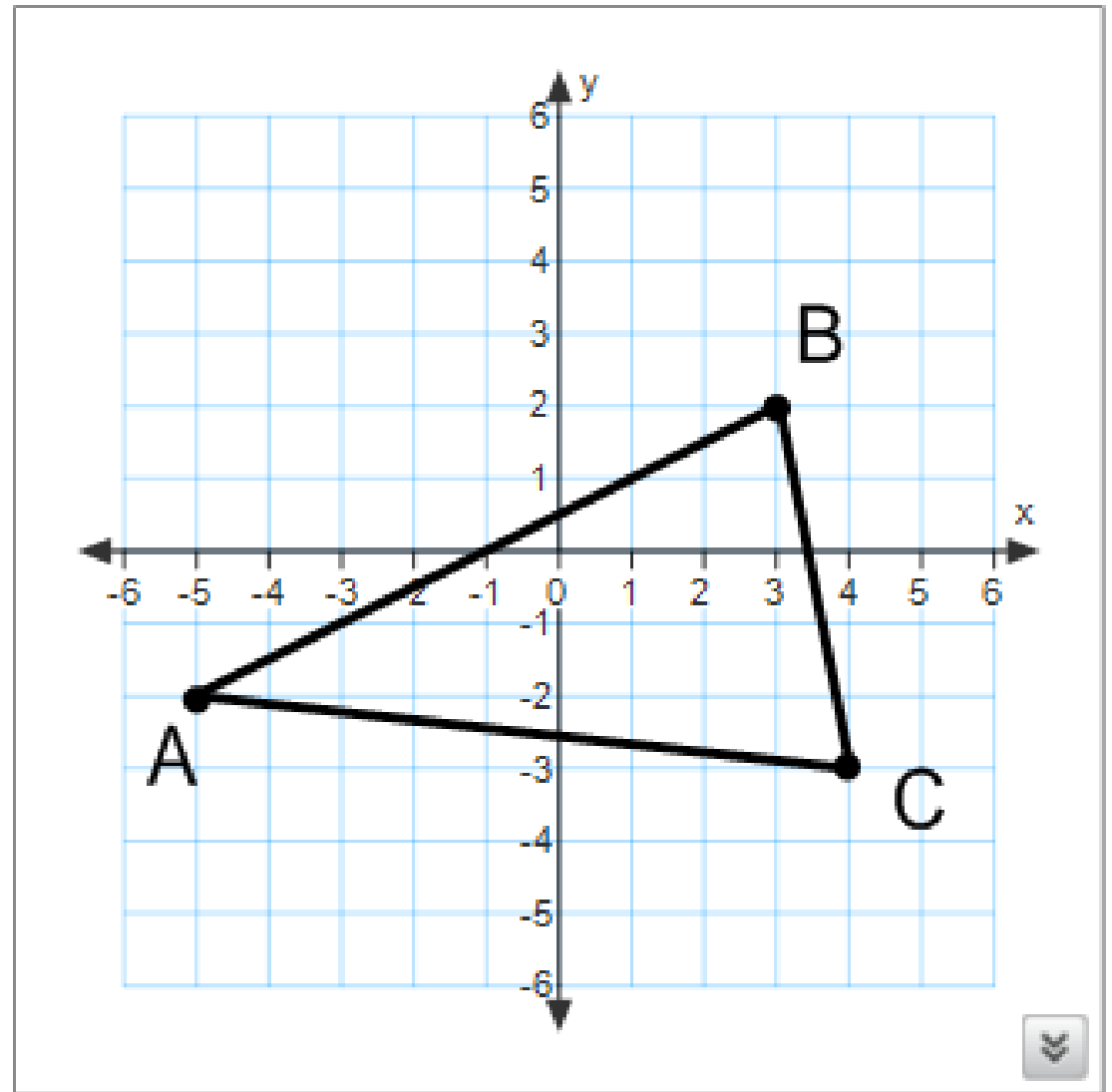


180° Counterclockwise rotation

A(-5,-2)

B(3,2)

C(4,-3)



Let's Talk about Notation Again

Rotations

$$90^{\circ}: R_{90^{\circ}}(x, y) = (\quad)$$

$$180^{\circ}: R_{180^{\circ}}(x, y) = (\quad)$$

$$270^{\circ}: R_{270^{\circ}}(x, y) = (\quad)$$

$$\text{Translation } T(x, y) = (\quad)$$

Line Reflections

$$\text{x-axis: } P(x, y) \longrightarrow P'(\quad) \text{ OR } r_{\text{x-axis}}(x, y) = (\quad)$$

$$\text{y-axis: } P(x, y) \longrightarrow P'(\quad) \text{ OR } r_{\text{y-axis}}(x, y) = (\quad)$$

$$\text{y=x: } P(x, y) \longrightarrow P'(\quad) \text{ OR } r_{\text{y=x}}(x, y) = (\quad)$$

$D(4, -3)$

R_{90°

R_{180°

$r_{x\text{-axis}}$

$T(x+4, y-2)$

R_{270°

$r_{y\text{-axis}}$

$r_{y=x}$

$G(-3, -4)$

R_{90°

R_{180°

$r_{x\text{-axis}}$

$T(x+4, y-2)$

R_{270°

$r_{y\text{-axis}}$

$r_{y=x}$