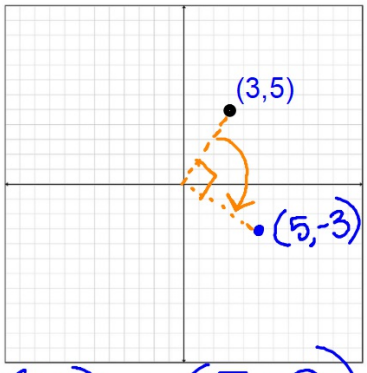
Rotations

In geometry, a transformation is an operation that moves, flips, or changes a shape to create a new shape. A **rotation** is an example of a transformation where a figure is rotated about a specific point (called the center of rotation), a certain number of degrees. Common rotations about the origin are shown below:

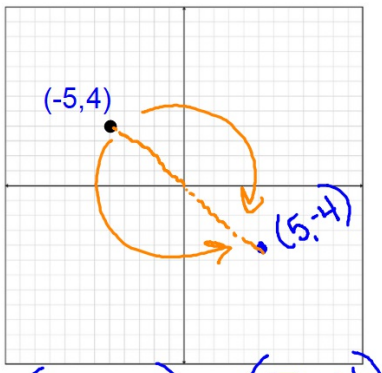
Center of Rotation	Angle of Rotation	Preimage (Point P)	Rotated (Point P')
	Clockwise / Counterclockwise (CCW)		
(0, 0)	90° (or −270°)	(x, y)	(y, -x)
(0, 0)	180° (or −180°)	(x, y)	$(-x, -y)$
(0, 0)	270° (or −90°)	(x, y)	(-y, x)

90° Clockwise
270° Counterclockwise



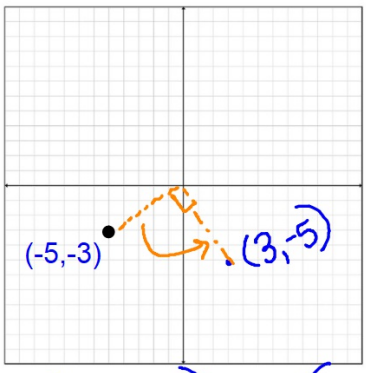
(3,5) → (5,-3)

180° either direction



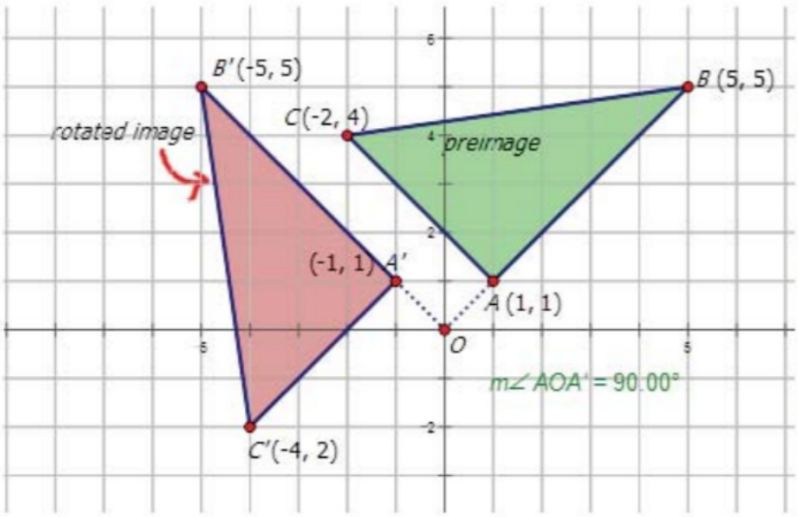
(-5,4) → (5,-4)

90° Counterclockwise
270° Clockwise



(-5,-3) → (+3

You can describe rotations in words, or with notation. Consider the image below:



Connect A to the origin.

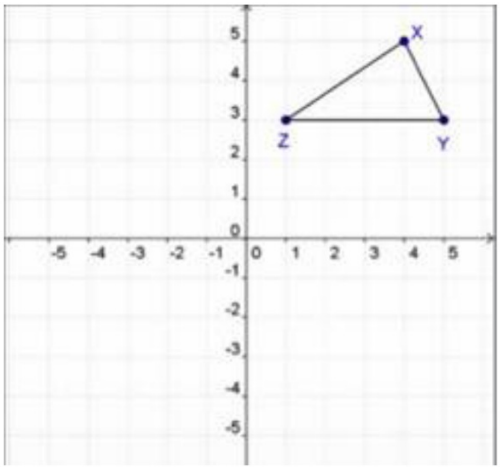
Connect the origin to A'

What is the measure of the angle that you just drew?

What is the direction of movement from A to A'?

Check your answer with B and B'

Rotation 180° clockwise



Label the coordinates.

Give the coordinates of both the preimage and the image.

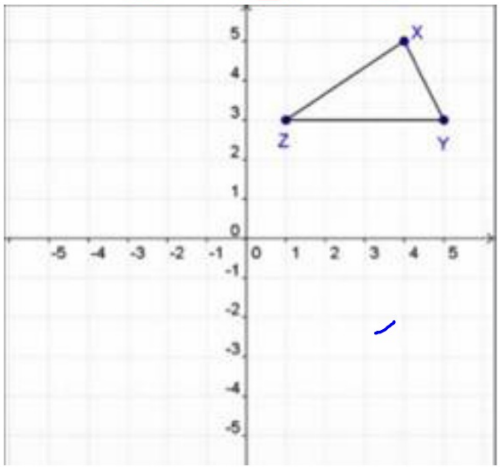
X(4 , 5) → **X'**(-4 , -5)

Y(5 , 3) → **Y'**(-5 , -3)

Z( ) , 3) → **Z'**(-1 , -3)

*change sign of x and y

Rotation 90° counterclockwise



Label the coordinates.

Give the coordinates of both the preimage and the image.

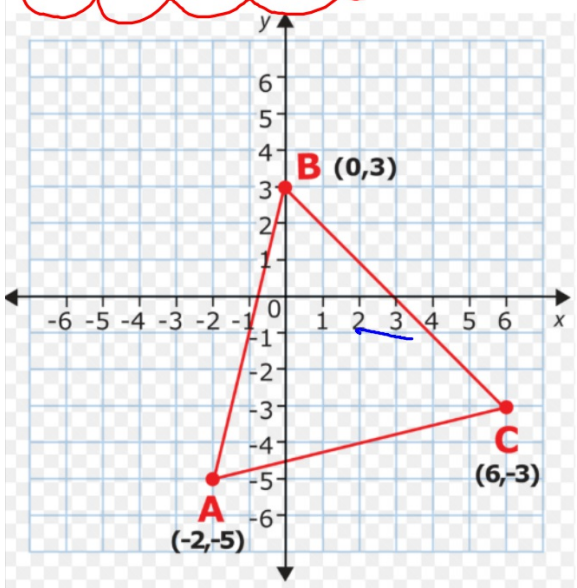
X(4 , 5) → **X'**(−5 , 4)

Y(5 , 3) → **Y'**(−3 , 5)

Z(1 , 3) → **Z'**(−3 , 1)

* Switch x + y, change sign of # on the left

Rotation 90° clockwise



Label the coordinates.

Give the coordinates of both the preimage and the imag

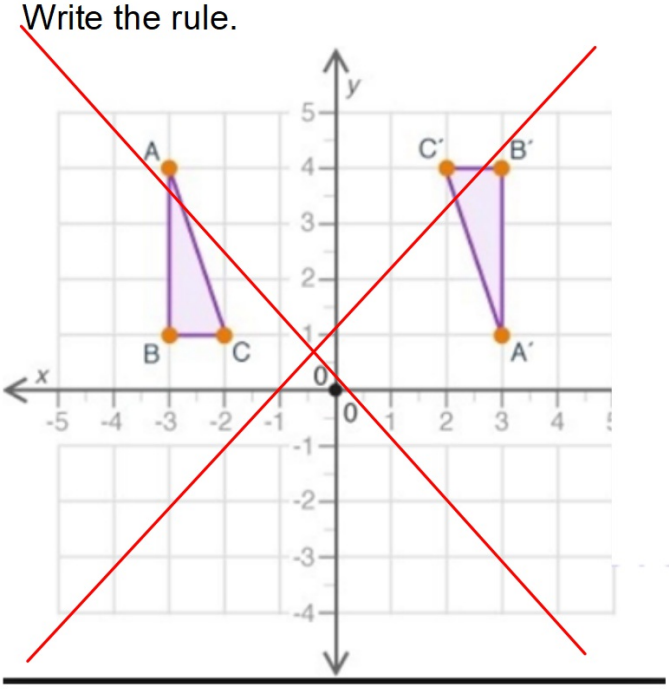
A(−2, −5) → **A'**(−5 , +2)

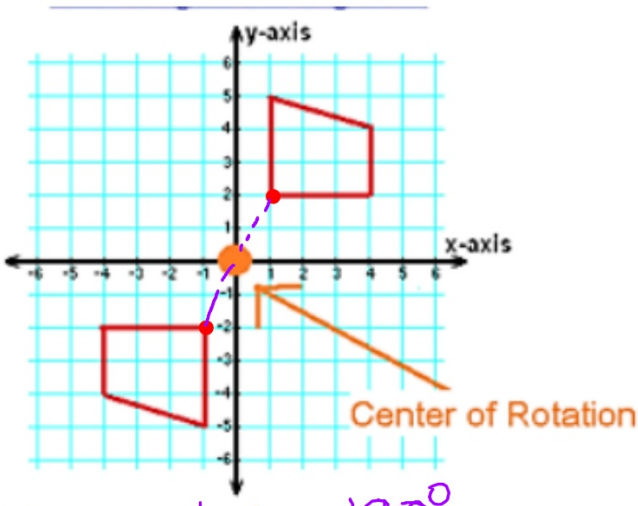
B(0 , 3) → **B'**(3 , 0)

C(6 , −3) → **C'**(−3 , −6)

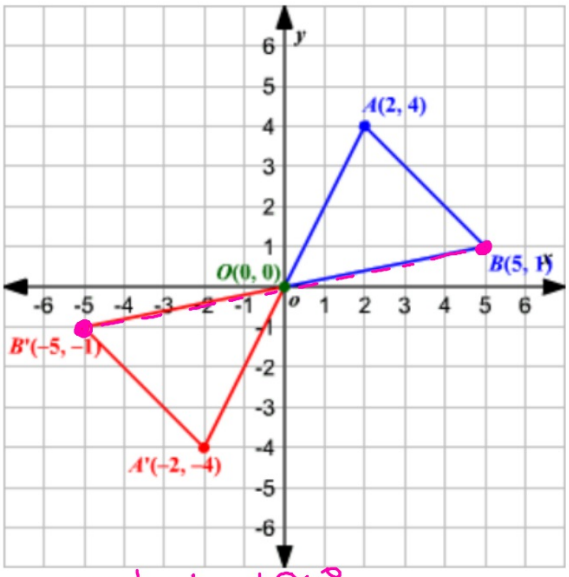
* Switch x and y, Change the sign of # on right

Write the rule.

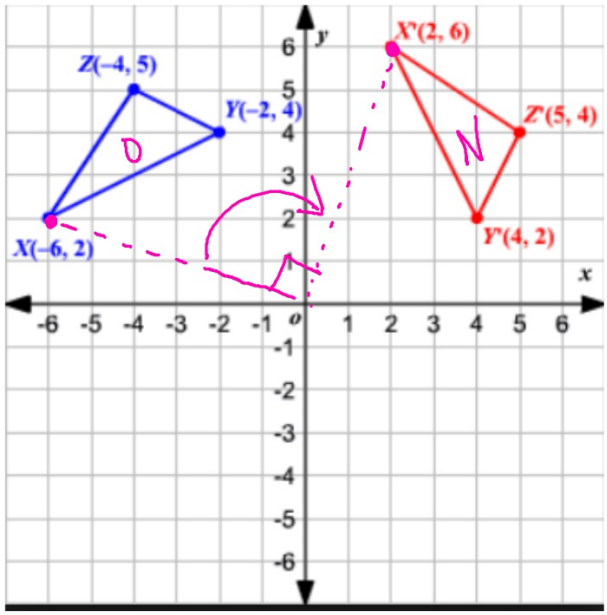




rotate 180°



rotate 180°



rotate 90° clockwise