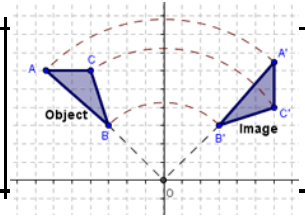


# Rotation

to turn a figure around in the coordinate plane based on a given center and degree of rotation



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## AROUND THE ORIGIN

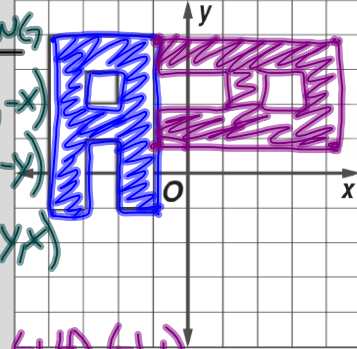
Clockwise ↻ CCW ↺ MAPPING

$90^\circ \rightarrow 270^\circ \rightarrow (x,y) \rightarrow (y,-x)$

$180^\circ \rightarrow 180^\circ \rightarrow (x,y) \rightarrow (-x,-y)$

$270^\circ \rightarrow 90^\circ \rightarrow (x,y) \rightarrow (-y,x)$

Rotate the figure 90° clockwise around the origin.



- (-1,4) (-1,1)
- (4,-1) (-1,-1)
- (-1,4) (-4,4)
- (4,1) (4,4)

## AROUND ROTATION

An image and its pre-image before a rotation are...

**Congruent**



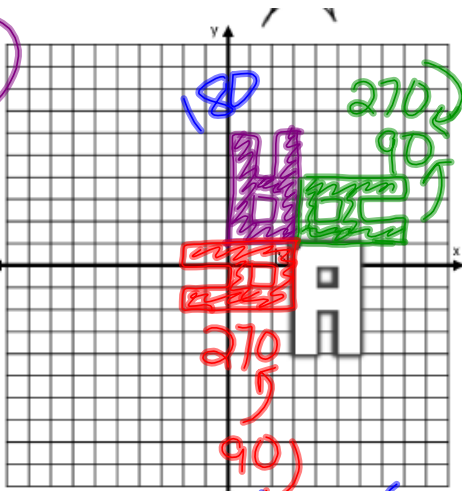
Identify key points in the pre-image



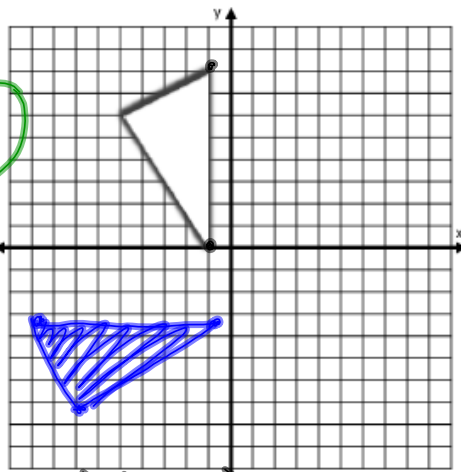
Create the image such that each point is rotated the correct number of degrees in

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Rotate the figure 180° around point N.



Rotate the figure 90° anticlockwise around the point (1, -2).



Name:

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

Around Point

$$\begin{array}{r}
 (-1, 0) \quad (-1, 8) \quad (-5, 6) \\
 - (1, -2) \quad - (1, -2) \quad - (1, -2) \quad \leftarrow \text{Subtract the Point} \\
 \hline
 (-2, 2) \quad (-2, 10) \quad (-6, 8) \\
 (-2, -2) \quad (-10, -2) \quad (-8, 6) \quad \leftarrow \text{apply the rule} \\
 + (1, -2) \quad + (1, -2) \quad + (1, -2) \quad \leftarrow \text{Add the Point} \\
 \hline
 (-1, -4) \quad (-9, -4) \quad (-7, -8)
 \end{array}$$