

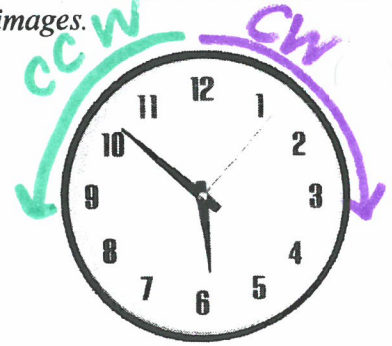
7-4 Rotations

Learning Target: *I can rotate figures to create congruent images.*

Date _____

Warm Up: Define the following-

- Counter-clockwise Turns to the Left
- Clock-wise Turns to the right



Discovery: "The Rules of Rotations"

Conclusions- Rules for Rotation

$R_{90, origin}(x, y)$ Counter-clockwise move ↓ 1 Quadrant $(-y, x)$
$R_{180, origin}(x, y)$ Counter-Clockwise moves ↓ 2 Quadrants $(-x, -y)$
$R_{270, origin}(x, y)$ Counter- Clockwise moves ↓ 3 Quadrants $(y, -x)$
$R_{360, origin}(x, y)$ Counter-Clockwise stays put! ↓ (x, y)

Go the Discovery Problem below:

(a) We are going to turn our paper to the **left** (counter-clockwise) to discover the rules of rotation.

- 90 degrees = 1 time
- 180 degrees = 2 times
- 270 degrees = 3 times
- 360 degrees = 4 times

(b) Read the coordinates as if the axes changed and write them on the line provided.

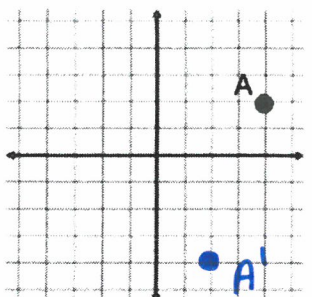
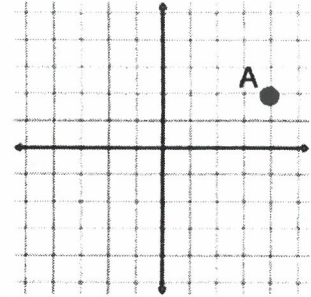
(c) Try to fill in the rules, but we will review them together!

Discovery Take the point $A(4, 2)$ and rotate it as stated. Plot A' and state its coordinates.
 (Remember positive numbers, you move in the counter-clockwise (CCW) direction.)

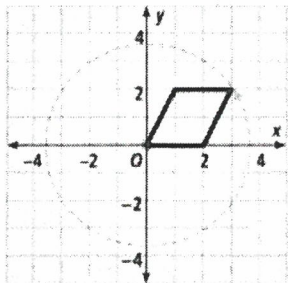
<p>Rotation of 90° (move one quad)</p> <div style="text-align: right; color: green; font-size: 1.2em;"> $A(4, 2)$ </div> <p>$A':$ <u>$(-2, 4)$</u></p>	<p>Rotation of 180° (move 2 quads)</p> <p>$A':$ <u>$(-4, -2)$</u></p>
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move 3 Quads

* Stays same!

<p>Rotation of 270°</p>  <p>A': <u>(2, -4)</u></p>	<p>Rotation of 360°</p>  <p>A': <u>(4, 2)</u></p>
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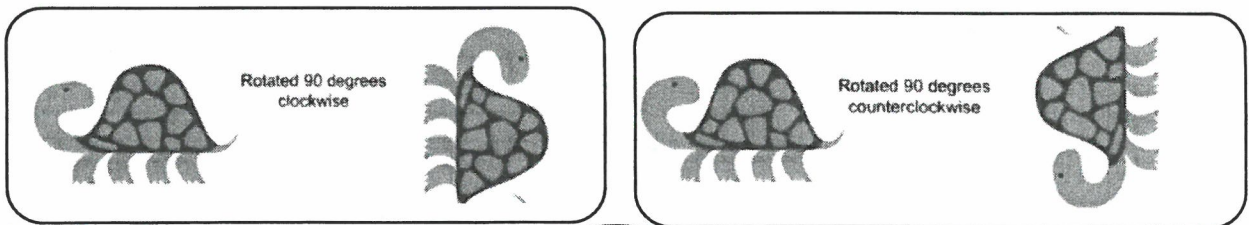
Guided Practice: Rotations on the Coordinate Plane:



A **rotation** is a rigid motion that turns a figure about a fixed point called the **center of rotation**.

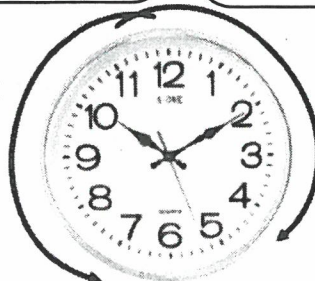
The **angle of rotation** is the number of degrees the figure rotates.

A rotated figure is the image of the original figure (pre-image). The side lengths and angle measures of the rotated figure do not change. As with translations and reflections, each side and angle of a rotated figure corresponds to the same side and angle of its original figure.



COUNTER
CLOCKWISE

CLOCKWISE



** Positive angles = counter - clockwise**

*** Always counter-clockwise unless stated, otherwise***