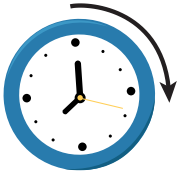


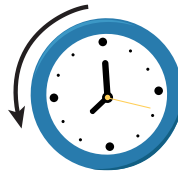
GUIDED NOTES (MODEL NOTES)

Vocabulary

- **Rotation:** a type of transformation where a preimage is spun by a certain angle measure around a fixed point that is the center of rotation.
- **Angle of rotation:** the number of degrees by which the preimage is rotated.



- **Clockwise (CW):** the direction in which the hands on a clock move



- **Counterclockwise (CCW):** the opposite direction in which the hands on a clock move

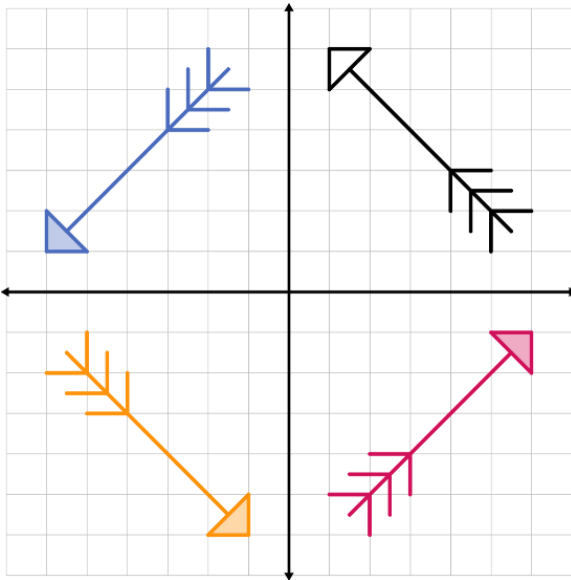
Assume rotations to be counterclockwise unless stated otherwise.

Is a rotation an example of rigid motion? Write your answer below.

Yes, because the preimage and image are congruent.

Special Rotations: Algebraic Rules

Fill in the blanks below.

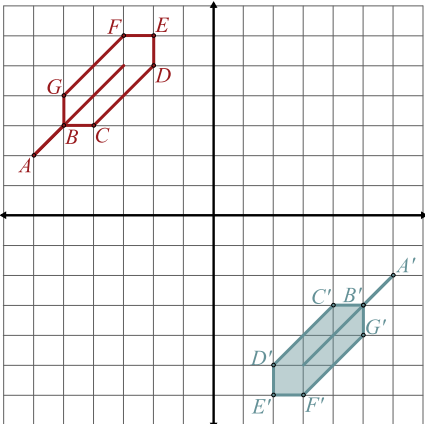


Rotate about the origin ...	Algebraic Rule
... 90° CCW	$(a, b) \rightarrow (-b, a)$
... 180° CCW	$(a, b) \rightarrow (-a, -b)$
... 270° CCW	$(a, b) \rightarrow (b, -a)$

- Rotating a figure 90° CCW is the same as rotating that figure 270° CW.
- Rotating a figure 180° CCW is the same as rotating that figure 180° CW.
- Rotating a figure 90° CW is the same as rotating that figure -90° CCW.

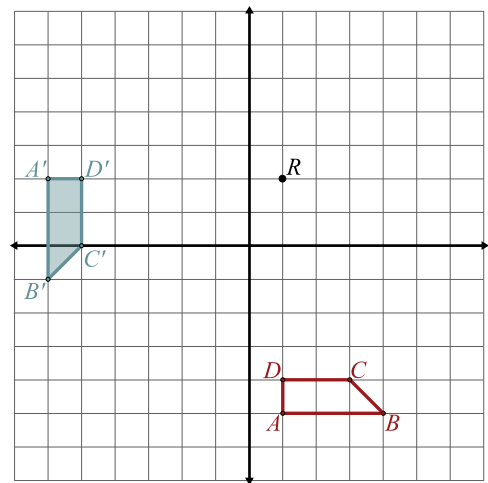
Applying Algebraic Rules

1) On the table below, draw the rotated image on the graph based on the provided preimage. Then, write a verbal description of the transformation.

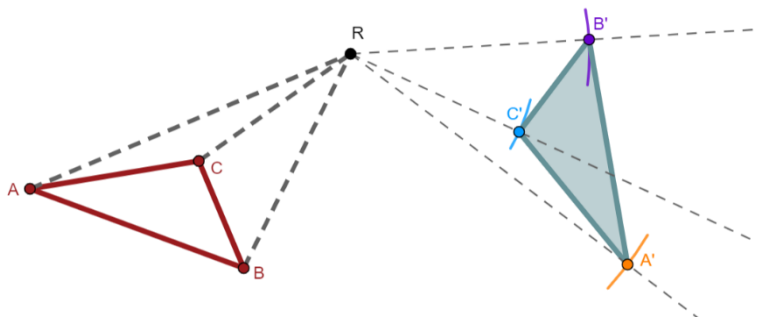
Graph	Verbal Description	Algebraic Rule
	<p><i>Rotate the preimage 180° about the origin.</i></p>	$(x, y) \rightarrow (-x, -y)$

Other Rotations

2) What if we rotate a figure around a point that is not the origin? Rotate the following preimage 270° about the point $R(1, 2)$.



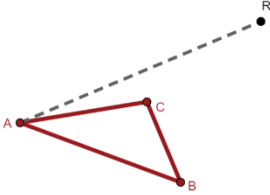
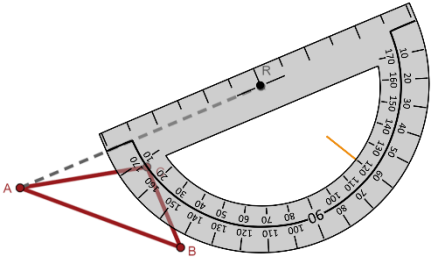
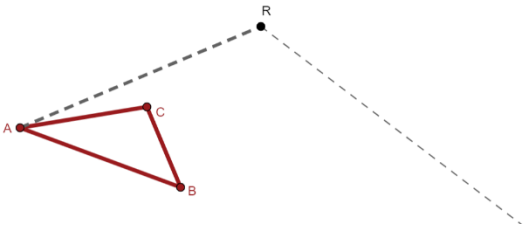
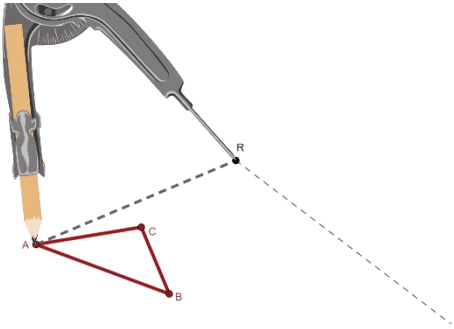
3) How should we transform a preimage that is not on a coordinate plane? Rotate the preimage below 120° about the given center of rotation, R . Draw the rotated image and mark its vertices.

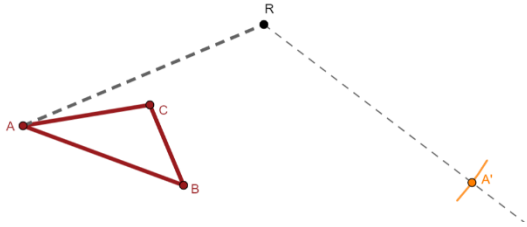
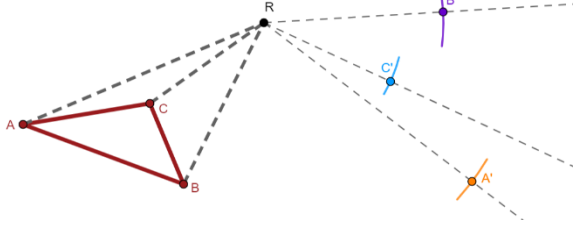
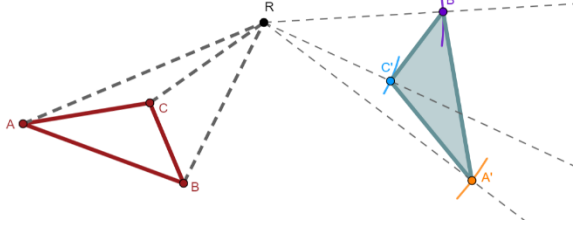


GUIDED NOTES (TEACHER GUIDE)

Example 3

Constructing a rotation with a compass and protractor.

Construction	Instruction
	<p>Step 1: Use the protractor to draw a line from <i>Point A</i> to <i>Point R</i>.</p>
	<p>Step 2: Use the protractor to measure 120° clockwise around <i>Point R</i>. Leave a mark at 120°.</p>
	<p>Step 3: Draw a light line from <i>Point R</i> through the mark.</p>
	<p>Step 4: Use the compass to measure the distance from <i>Point R</i> to <i>Point A</i>.</p>

Construction	Instruction
	<p>Step 5: Use the compass measurement as the radius to construct an arc that intersects the 120° line. Label the intersection point A'.</p>
	<p>Step 6: Repeat steps 1–5 for to draw B' and C'. $m\angle ARA' = 120^\circ$. This will also be the case for $m\angle BRB'$ and $m\angle CRC'$.</p>
	<p>Step 7: Use the protractor to draw lines that connect A', B', and C'.</p>