

Geometry

Rotations

Name: Key

Date: _____

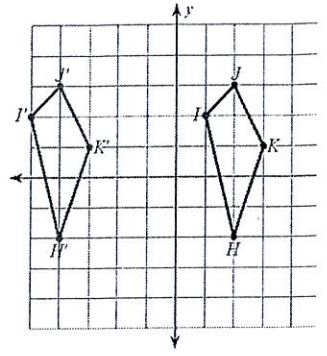
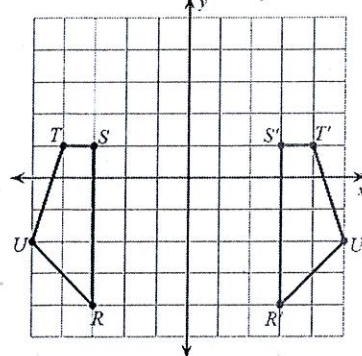
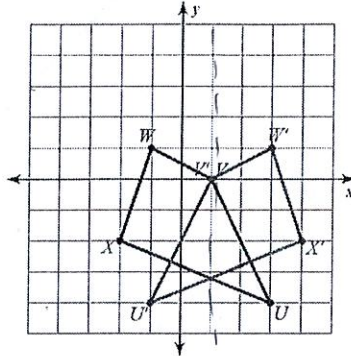
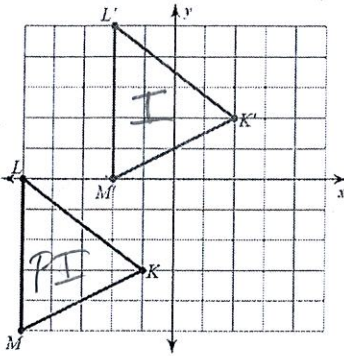
Warm-up – Translations & Reflections

Describe the translation or reflection that occurs.

1. translation $\langle 3, 5 \rangle$ 2. reflection $x=1$

3. reflection y -axis

4. translation $\langle -6, 0 \rangle$



ROTATION: A transformation that turns a figure about a fixed point through a given angle and given direction. The amount of rotation is called the degree of rotation and it is measured in degrees. Figures can be rotated clockwise (cw) or counterclockwise (ccw). The rotations we are going to focus on are 90 degrees clockwise, 90 degrees counterclockwise, and 180 degrees around the origin.

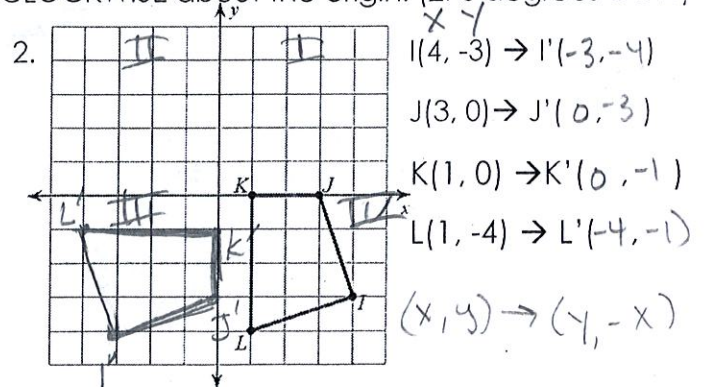
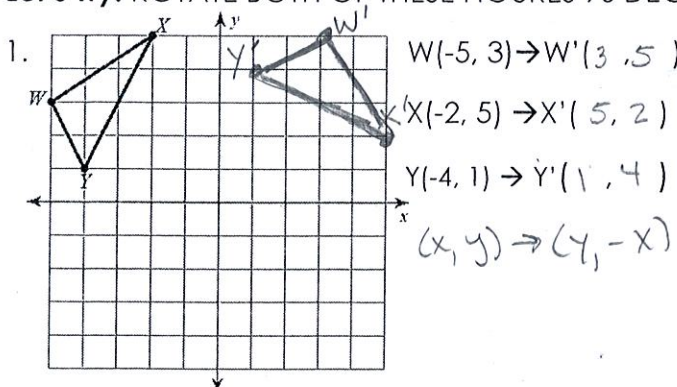
ROTATIONS:

90 degrees clockwise: $(x, y) \rightarrow (y, -x)$

90 degrees counterclockwise: $(x, y) \rightarrow (-y, x)$

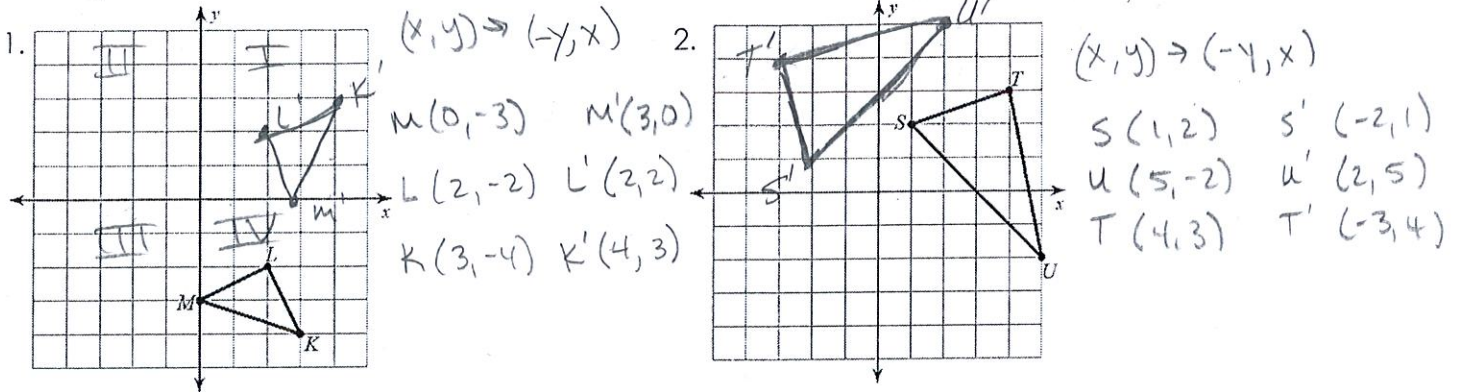
180 degree rotation: $(x, y) \rightarrow (-x, -y)$

Let's Try! ROTATE BOTH OF THESE FIGURES 90 DEGREES CLOCKWISE about the origin! (270 degrees CCW)

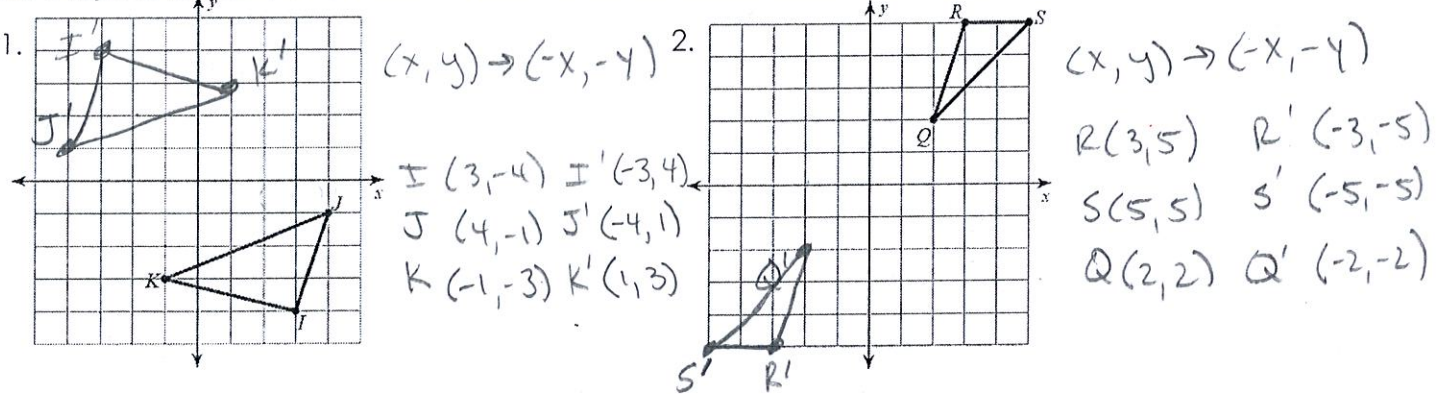


90 degrees clockwise: $(x, y) \rightarrow (y, -x)$
90 degrees counterclockwise: $(x, y) \rightarrow (-y, x)$
180 degree rotation: $(x, y) \rightarrow (-x, -y)$

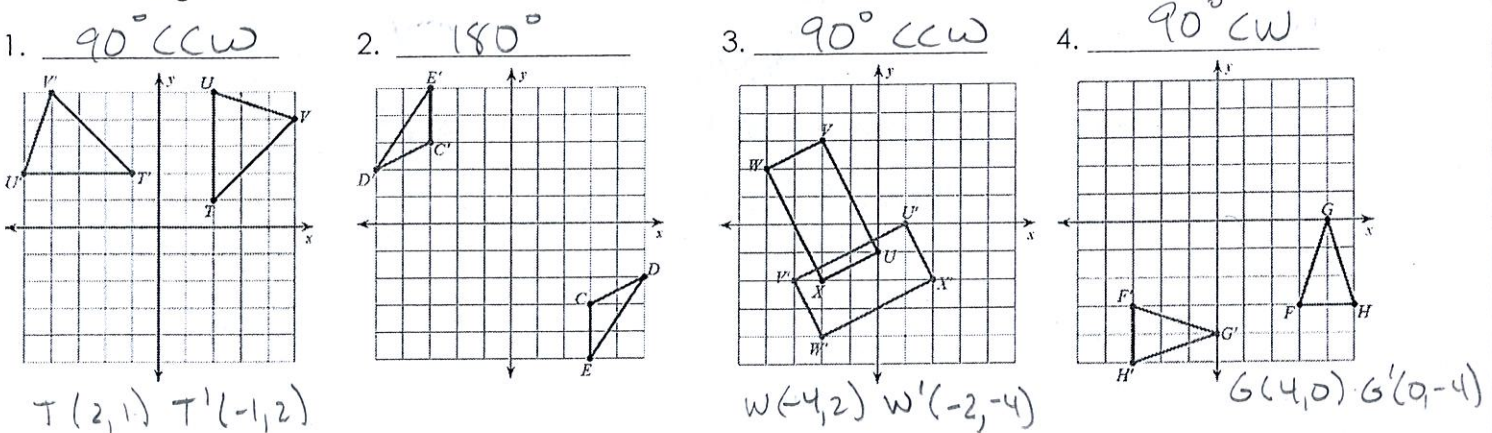
Let's Try! ROTATE BOTH OF THESE FIGURES 90 DEGREES CCW about the origin! (270 degrees CW)



Let's Try! ROTATE BOTH OF THESE FIGURES 180 DEGREES about the origin!



Write the degree and direction of the rotation shown below!



If the vertices of $\triangle ABC$ are $A(0, 5)$, $B(-4, 2)$, and $C(10, -6)$, find the vertices of $\triangle A'B'C'$ after each of the translations below.

- a. $(x, y) \rightarrow (-y, x)$ $A' = (-5, 0)$ $B' = (-2, -4)$ $C' = (6, 10)$ Transformation: 90° CCW rotation
- b. $(x, y) \rightarrow (y, -x)$ $A' = (5, 0)$ $B' = (2, 4)$ $C' = (-6, -10)$ Transformation: 90° CW rotation
- c. $(x, y) \rightarrow (-x, -y)$ $A' = (0, -5)$ $B' = (4, -2)$ $C' = (-10, 6)$ Transformation: 180° rotation