

Write

In your own words, explain how each rotation about the origin affects the coordinate points of a figure.

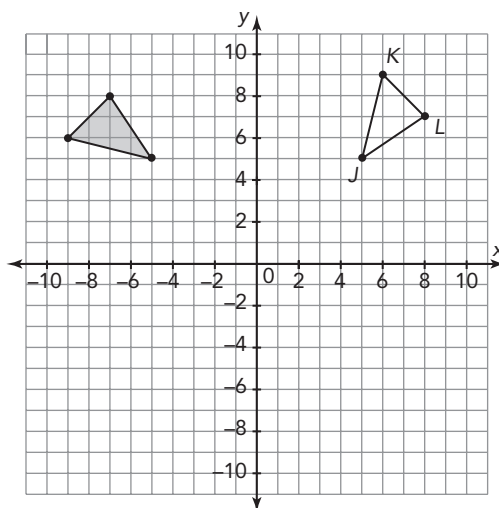
- a counterclockwise rotation of 90°
- a clockwise rotation of 90°
- a rotation of 180°

Remember

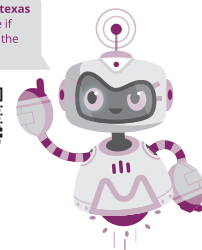
A rotation “turns” a figure about a point. A rotation is a rigid motion that preserves the size and shape of figures.

Practice

1. Use $\triangle JKL$ and the coordinate plane to answer each question.



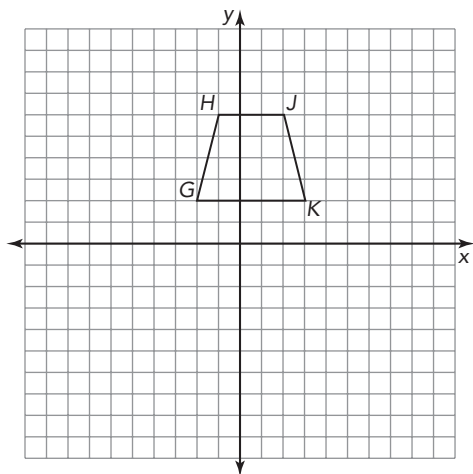
Visit livehint.com/texas or use this QR code if you need a hint on the Practice questions.



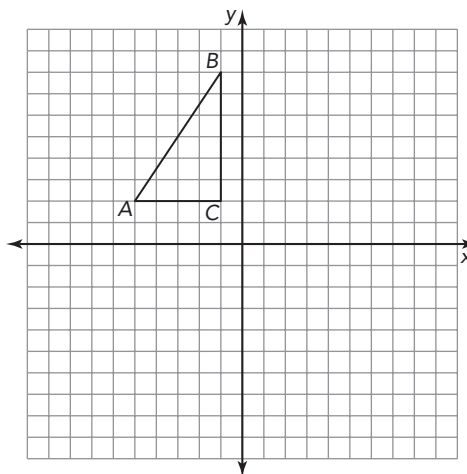
- List the coordinates of each vertex of $\triangle JKL$.
 - Describe the rotation that you can use to move $\triangle JKL$ onto the shaded area on the coordinate plane. Use the origin as the point of rotation.
 - Determine what the coordinates of the vertices of the rotated $\triangle J'K'L'$ will be if you perform the rotation you described in your answer to part (b). Explain how you determined your answers.
 - Verify your answers by graphing $\triangle J'K'L'$ on the coordinate plane.
2. Determine the coordinates of each triangle's image after the given transformation.
- Triangle ABC with coordinates $A(3, 4)$, $B(7, 7)$, and $C(8, 1)$ is translated 6 units left and 7 units down.
 - Triangle DEF with coordinates $D(-2, 2)$, $E(1, 5)$, and $F(4, -1)$ is rotated 90° counterclockwise about the origin.
 - Triangle GHJ with coordinates $G(2, -9)$, $H(3, 8)$, and $J(1, 6)$ is reflected across the x -axis.
 - Triangle KLM with coordinates $K(-4, 2)$, $L(-8, 7)$, and $M(3, -3)$ is translated 4 units right and 9 units up.
 - Triangle NPQ with coordinates $N(12, -3)$, $P(1, 2)$, and $Q(9, 0)$ is rotated 180° about the origin.

Stretch

1. Rotate Trapezoid $GHJK$ 90° clockwise around point G .



2. Rotate $\triangle ABC$ 135° clockwise around point C .



Review

Given a triangle with the vertices $A(1, 3)$, $B(4, 8)$, and $C(5, 2)$. Determine the vertices of each described transformation.

1. A reflection across the x -axis.
2. A reflection across the y -axis.
3. A translation 5 units horizontally.
4. A translation -4 units vertically.

Rewrite each expression using properties.

5. $2(x + 4) - 3(x - 5)$
6. $10 - 8(2x - 7)$