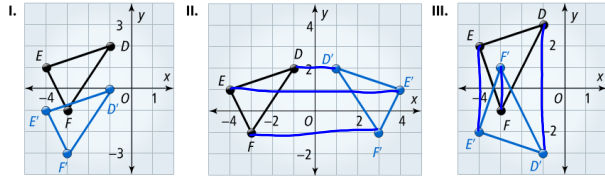


REFLECTIONS

Translation

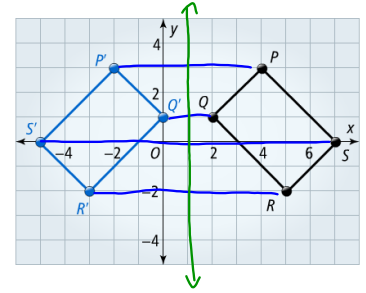
Reflection
y-axis

Reflection
x-axis



Example

PQRS is a rectangle. Describe in words how to map PQRS to its image P'Q'R'S'. Then use arrow notation to show how each vertex of PQRS maps to its image.

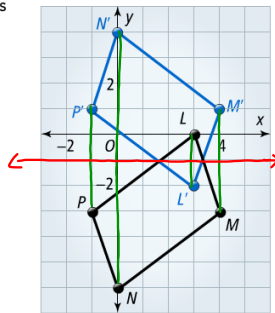


$X = -1$

Got It?

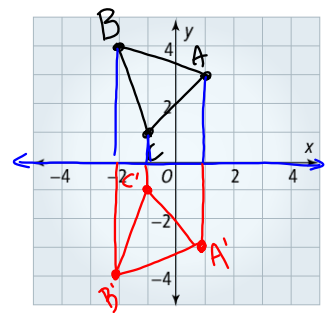
LMNP is a parallelogram. Describe in words how to map LMNP to its image L'M'N'P'.

$Y = -1$

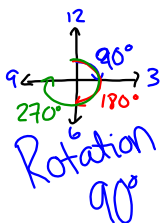


Example

The vertices of $\triangle ABC$ are $A(1, 3)$, $B(-2, 4)$, and $C(-1, 1)$. Graph $\triangle ABC$ and $\triangle A'B'C'$, its image after a reflection across the x-axis.

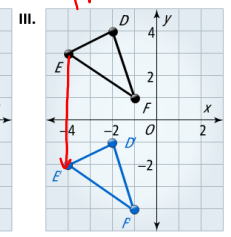
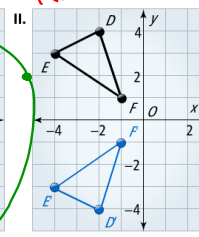
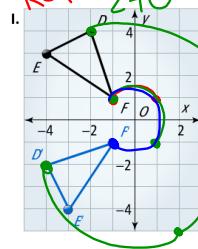
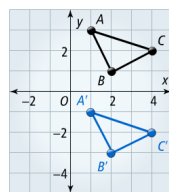
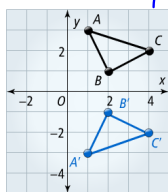
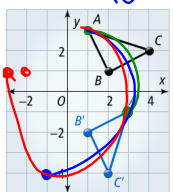


ROTATIONS



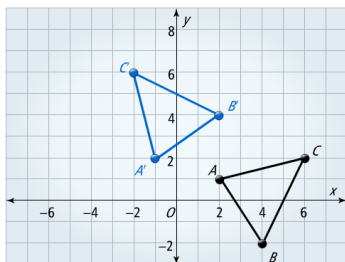
Reflection over x-axis Translation

Rotation 270° Reflection Translation



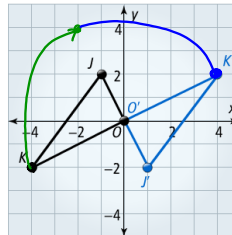
Example

What is the angle of rotation about the origin that maps $\triangle ABC$ to $\triangle A'B'C'$?



Got It?

What is the angle of rotation about the origin that maps $\triangle JKO$ to $\triangle J'K'O'$?



180°

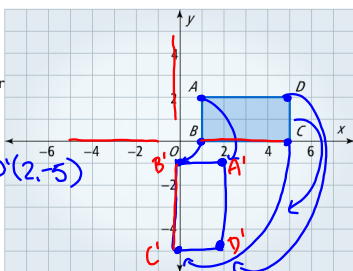
Example

Rectangle $ABCD$ has coordinates $A(1, 2)$, $B(1, 0)$, $C(5, 0)$, and $D(5, 2)$.

- Drag the blue rectangle to show the image of $ABCD$ after a rotation of 90° about the origin.

• Label the vertices of the image.

- Use arrow notation to show how each vertex of $ABCD$ maps to its image.

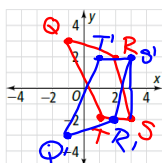


Got It?

Point P has coordinates $(3, 0)$. If you rotate P 270° about the origin, what are the coordinates of P' ?

Do you know HOW?

- The vertices of quadrilateral $QRST$ are $Q(-1, 3)$, $R(2, 2)$, $S(3, -2)$, $T(1, -2)$. Graph quadrilateral $QRST$ and quadrilateral $Q'R'S'T'$, its image after a reflection across the x -axis.



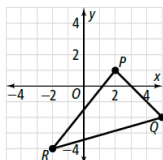
- Use arrow notation to show how $QRST$ maps to $Q'R'S'T'$ from Exercise 1.

$Q((-1, 3)) \rightarrow Q'((-1, -3))$
 $R((2, 2)) \rightarrow R'((2, -2))$
 $S((3, -2)) \rightarrow S'((3, 2))$
 $T((-1, -2)) \rightarrow T'((-1, 2))$

Do you UNDERSTAND?

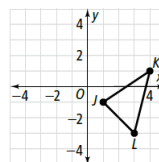
- Compare and Contrast** How are translations and reflections the same and different?

- Error Analysis** A classmate says that the reflection across the x -axis of $\triangle PQR$ is $\triangle P'Q'R'$ where $P(-2, 1)$, $Q(-5, -2)$, and $R(2, -4)$. What error did he make? What should the vertices be?



Do you know HOW?

- Use arrow notation to show how $\triangle JKL$ maps to its image after a rotation 180° about the origin.



$J(()) \rightarrow J'(())$
 $K(()) \rightarrow K'(())$
 $L(()) \rightarrow L'(())$

- The vertices of parallelogram $WXYZ$ are $W(-1, 1)$, $X(3, 2)$, $Y(3, -1)$, $Z(-1, -2)$. The vertices of its image, parallelogram $W'X'Y'Z'$, are $W'(-1, 1)$, $X'(3, 2)$, $Y'(3, -1)$, $Z'(-1, -2)$. What is the angle of rotation?

Do you UNDERSTAND?

- Compare and Contrast** How are reflections and rotations the same and different?

- Reasoning** Would the relationship between the vertices of any figure rotated 360° and its image always be true regardless of the point of rotation? Explain.

