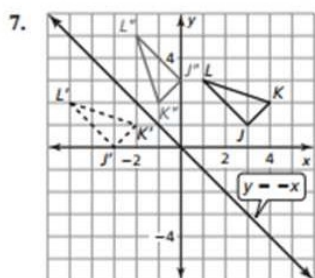
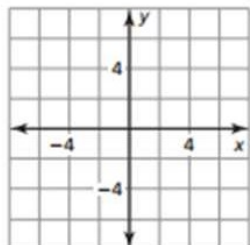


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In Exercises 7 and 8, graph $\triangle JKL$ with vertices $J(3, 1)$, $K(4, 2)$, and $L(1, 3)$ and its image after the glide reflection.

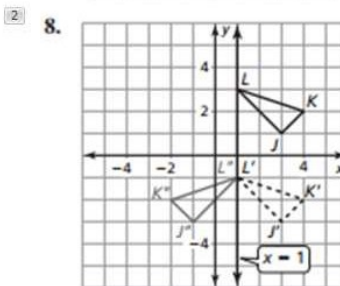
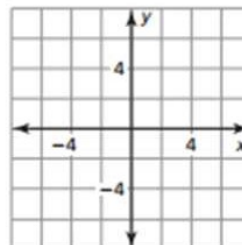
7. Translation: $(x, y) \rightarrow (x - 6, y - 1)$

Reflection: in the line $y = -x$



8. Translation: $(x, y) \rightarrow (x, y - 4)$

Reflection: in the line $x = 1$

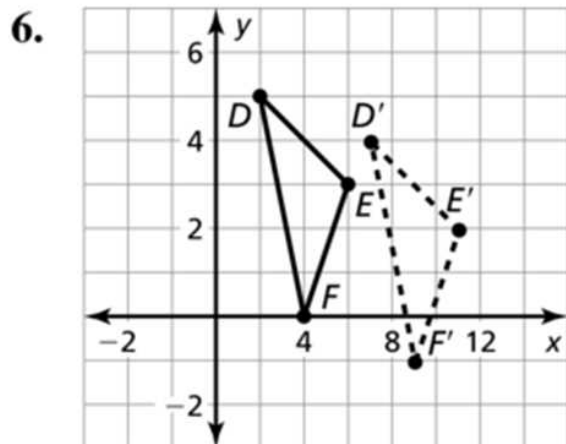


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3. $\overrightarrow{CD}, \langle 7, -3 \rangle$

10. $\langle -1, 2 \rangle$



13. $A'(-6, 10)$

14. $B'(-9, 9)$

15. $C(5, -14)$

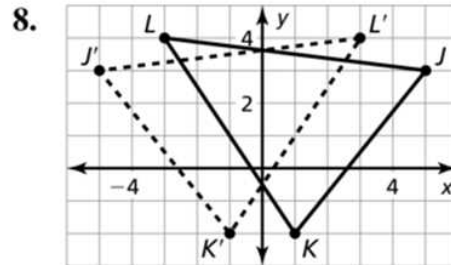
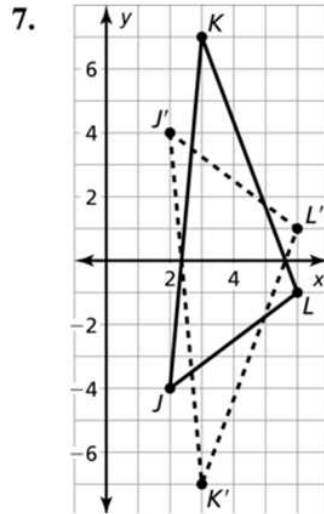
16. $D(12, -7)$

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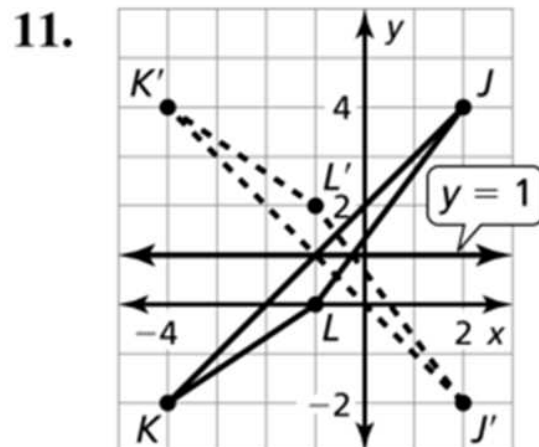
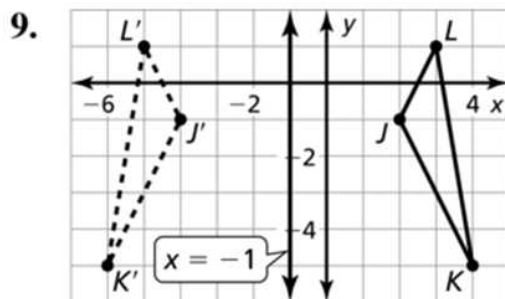
- 3. y-axis
- 4. neither
- 5. neither
- 6. x-axis



Answers homework

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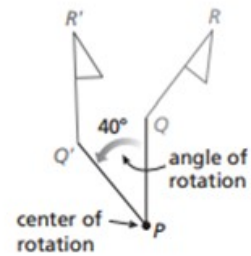


Rotations

A **rotation** is a transformation in which a figure is turned about a fixed point called the **center of rotation**. Rays drawn from the center of rotation to a point and its image form the **angle of rotation**.

A rotation about a point P through an angle of x° maps every point Q in the plane to a point Q' , so that one of the following properties is true.

- If Q is not the center of rotation P , then $QP = Q'P$ and $m\angle QPQ' = x^\circ$, or
- If Q is the center of rotation P , then $Q = Q'$.

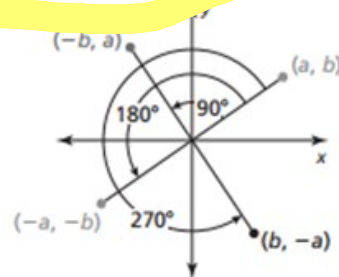


Coordinate Rules for Rotations about the Origin

When a point (a, b) is rotated counterclockwise about the origin, the following are true:

- For a rotation of 90° , $(a, b) \rightarrow (-b, a)$.
- For a rotation of 180° , $(a, b) \rightarrow (-a, -b)$.
- For a rotation of 270° , $(a, b) \rightarrow (b, -a)$.

Notes:



Graph quadrilateral $RSTU$ with vertices $R(3, 1)$, $S(5, 1)$, $T(5, -3)$, and $U(2, -1)$ and its image after a 270° rotation about the origin.

SOLUTION

Use the coordinate rule for a 270° rotation to find the coordinates of the vertices of the image. Then graph quadrilateral $RSTU$ and its image.

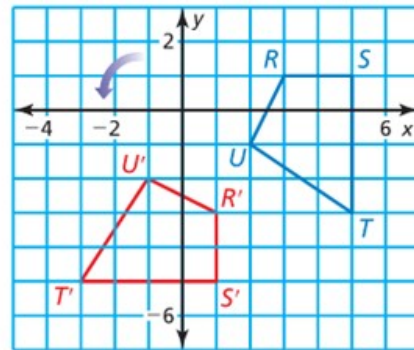
$$(a, b) \rightarrow (b, -a)$$

$$R(3, 1) \rightarrow R'(1, -3)$$

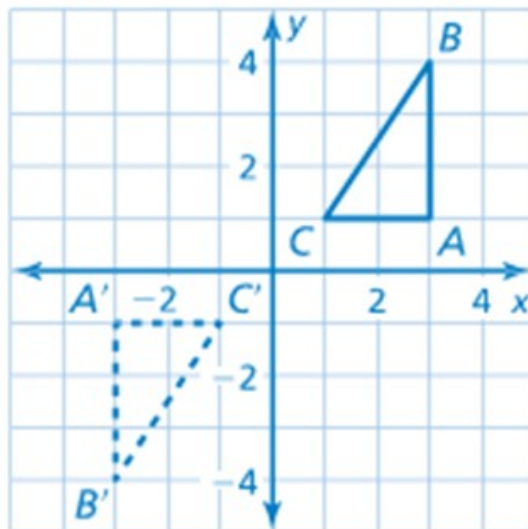
$$S(5, 1) \rightarrow S'(1, -5)$$

$$T(5, -3) \rightarrow T'(-3, -5)$$

$$U(2, -1) \rightarrow U'(-1, -2)$$



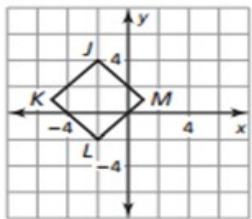
Graph $\triangle ABC$ with vertices $A(3, 1)$, $B(3, 4)$, and $C(1, 1)$ and its image after a 180° rotation about the origin.



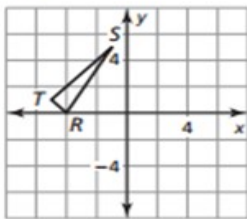
Extra Practice

In Exercises 1–3, graph the image of the polygon after a rotation of the given number of degrees about the origin.

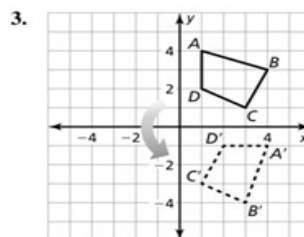
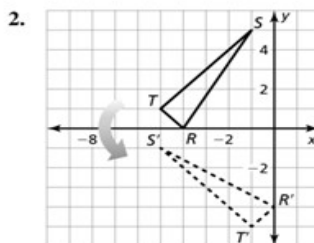
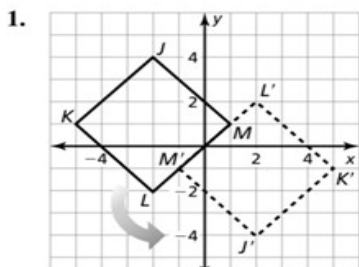
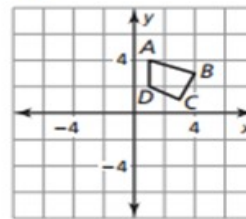
1. 180°



2. 90°



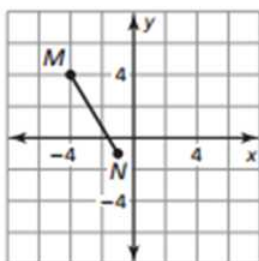
3. 270°



In Exercises 4–7, graph the image of \overline{MN} after the composition.

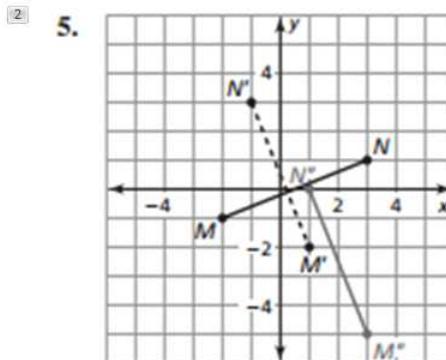
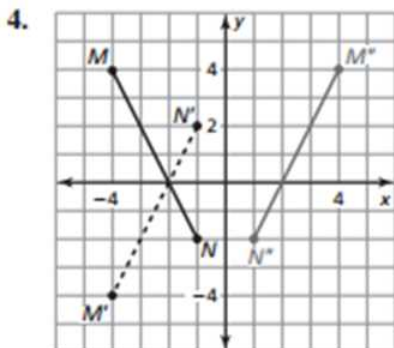
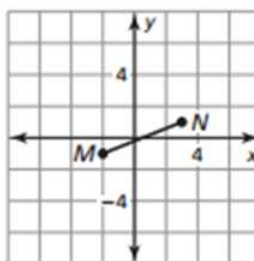
4. Reflection: x -axis

Rotation: 180° about the origin

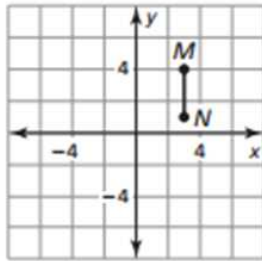


5. Rotation: 90° about the origin

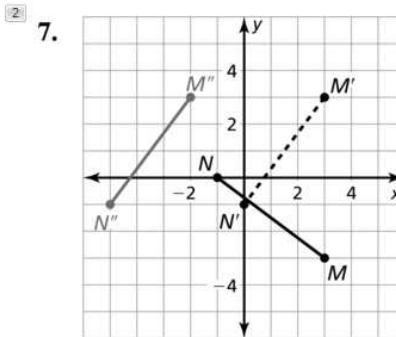
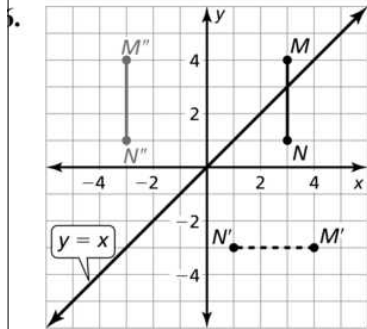
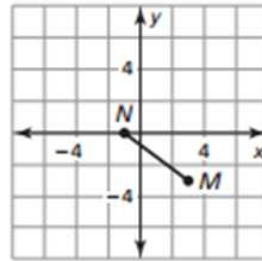
Translation: $(x, y) \rightarrow (x + 2, y - 3)$



6. **Rotation:** 270° about the origin
Reflection: in the line $y = x$



7. **Rotation:** 90° about the origin
Translation: $(x, y) \rightarrow (x - 5, y)$



Practice work

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TURN IN