

6.2

Good Lighting

Rotations

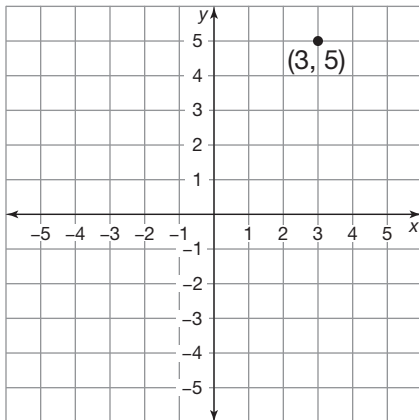
Students should be able to answer these questions after Lesson 6.2:

- What is a rotation?
- How are rotations within the coordinate plane performed?

Directions

Read Question 1 and its solution. The center of rotation is the origin. Then identify the coordinates of each point in Questions 2 and 3 after it has been rotated 90° counterclockwise, 180° , and 90° clockwise.

1. Identify the coordinates of the point below after it has been rotated 90° counterclockwise, 180° , and 90° clockwise.



Step 1 90° counterclockwise: $(-5, 3)$

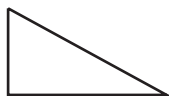
Step 2 180° : $(-3, -5)$

Step 3 90° clockwise: $(5, -3)$

2. $(-2, 4)$

3. $(4, -3)$

11. Draw the image created by a 90° counterclockwise rotation.



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12. Draw the image created by a 90° counterclockwise rotation.



Determine the coordinates of the endpoints of the line segment after the given rotation about the origin.

13. The line segment with endpoints $(8, -3)$ and $(-4, 2)$ is rotated 90° counterclockwise.

14. The line segment with endpoints $(3, 2)$ and $(-5, -1)$ is rotated 180° clockwise.

15. The line segment with endpoints $(6, 9)$ and $(2, 7)$ is rotated 90° clockwise.

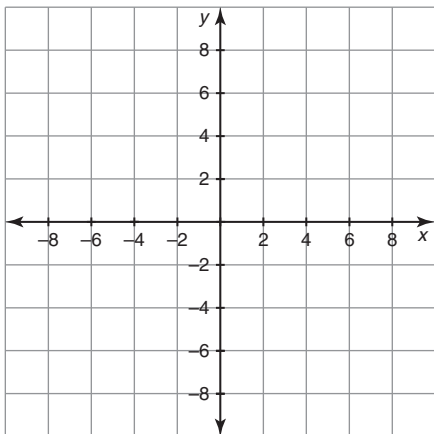
16. The line segment with endpoints $(7, -8)$ and $(-3, -5)$ is rotated 90° clockwise.

17. The line segment with endpoints $(-9, 4)$ and $(1, 6)$ is rotated 180° counterclockwise.

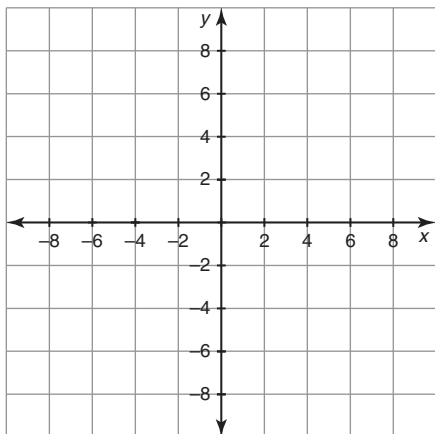
18. The line segment with endpoints $(2, -1)$ and $(9, 4)$ is rotated 90° counterclockwise.

Determine the coordinates of the vertices of the triangle after the given rotation about the origin. Then graph the preimage and the image on the same grid.

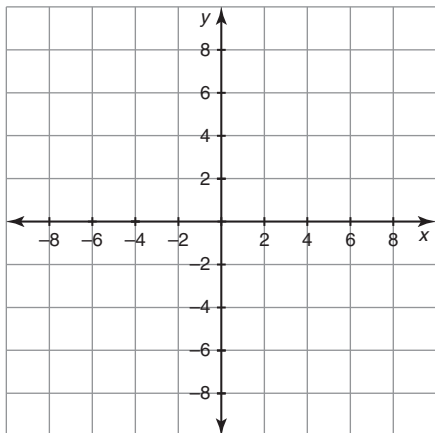
19. $\triangle ABC$ has vertices $A(2, 1)$, $B(6, 3)$, and $C(7, 9)$. What is the image created by a 90° clockwise rotation?



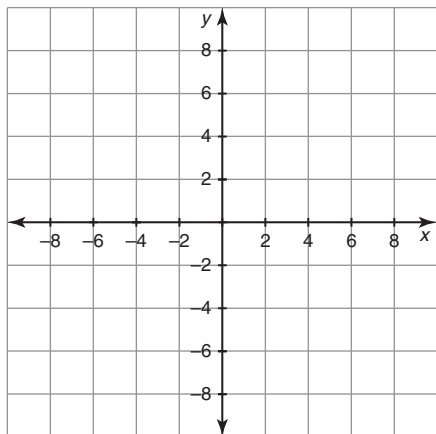
20. $\triangle DEF$ has vertices $D(-4, 8)$, $E(-6, 2)$, and $F(-1, 3)$. What is the image created by a 90° clockwise rotation?



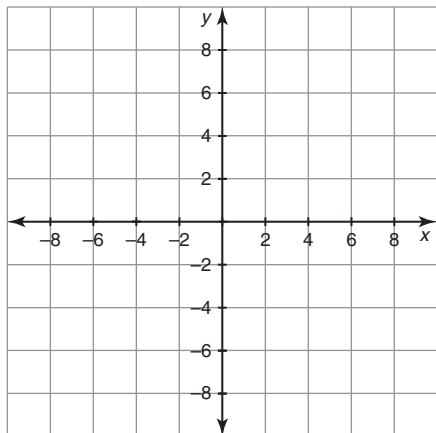
21. $\triangle GHI$ has vertices $G(5, 0)$, $H(-2, 4)$, and $I(3, -3)$. What is the image created by a 180° clockwise rotation?



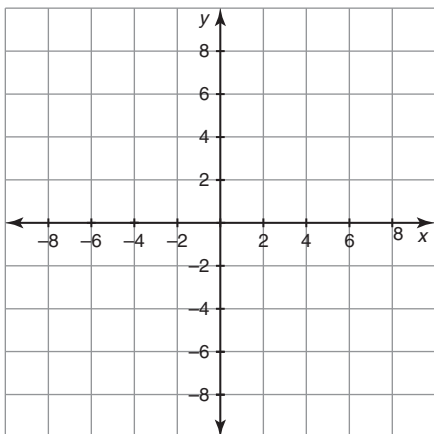
22. $\triangle JKL$ has vertices $J(-6, 2)$, $K(-1, 3)$, and $L(0, 7)$. What is the image created by a 180° counterclockwise rotation?



23. $\triangle MNO$ has vertices $M(-9, -5)$, $N(-7, -1)$, and $O(-2, -6)$. What is the image created by a 90° counterclockwise rotation?



24. $\triangle PQR$ has vertices $P(0, 6)$, $Q(8, -1)$, and $R(2, -3)$. What is the image created by a 90° counterclockwise rotation?



Given a transformation, identify another transformation or pair of transformations that would yield the same result. Use coordinate notation to explain how you found your answer.

25. The line segment with endpoints $A(2, 5)$ and $B(3, -2)$ is rotated 90° counterclockwise about the origin. Which pair of reflections would yield the same image?