

7.2

Reflections

- Goals**
- Identify reflections in a plane.
 - Identify relationships between reflections and line symmetry.

VOCABULARY

Reflection A reflection is a type of transformation that uses a line that acts like a mirror, with an image reflected in the line.

Line of reflection In a reflection, the mirror line is called a line of reflection.

Line of symmetry A line of symmetry is a line that a figure in the plane has if the figure can be mapped onto itself by a reflection in the line.

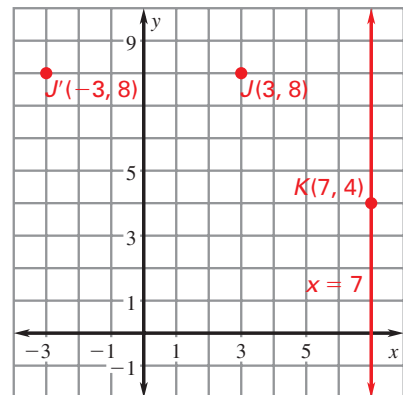
Example 1 Reflections in a Coordinate Plane

Graph the given reflection.

- $J(3, 8)$ in the y -axis
- $K(7, 4)$ in the line $x = 7$

Solution

- Because J is 3 units to the right of the y -axis, its reflection, J' , is 3 units to the left of the y -axis. Graph and label J' .
- Graph and label K and the line $x = 7$. Because K is on the line, this implies that $K = K'$.



REFLECTIONS IN THE COORDINATE AXES

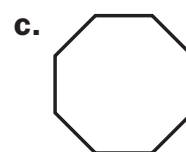
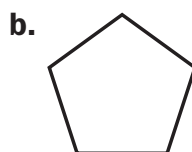
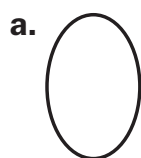
1. If (x, y) is reflected in the x -axis, its image is the point $(\underline{x}, \underline{-y})$.
2. If (x, y) is reflected in the y -axis, its image is the point $(\underline{-x}, \underline{y})$.

THEOREM 7.1: REFLECTION THEOREM

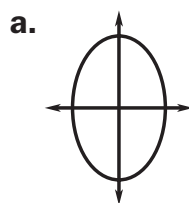
A reflection is an isometry.

Example 2 Finding Lines of Symmetry

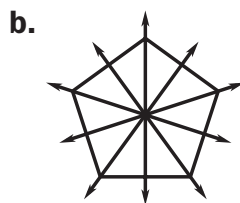
How many lines of symmetry does the figure have?



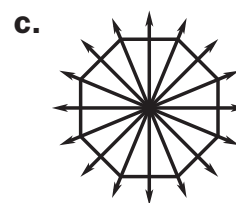
Solution



This oval has two lines of symmetry.



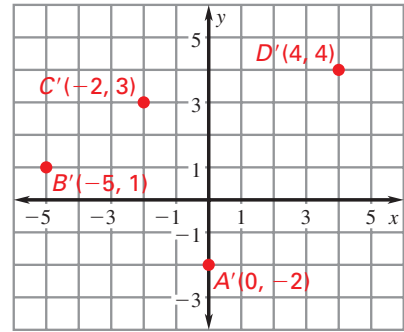
This pentagon has five lines of symmetry.



This octagon has eight lines of symmetry.

- ✔ **Checkpoint** Graph the given reflection in the coordinate plane. Label each image.

1. $A(0, 2)$ in the x -axis
2. $B(5, 1)$ in the y -axis
3. $C(-4, 3)$ in the line $x = -3$
4. $D(4, 0)$ in the line $y = 2$



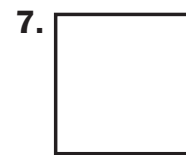
Determine the number of lines of symmetry that the figure has.



1



3



4