Unit 7, Lesson 15

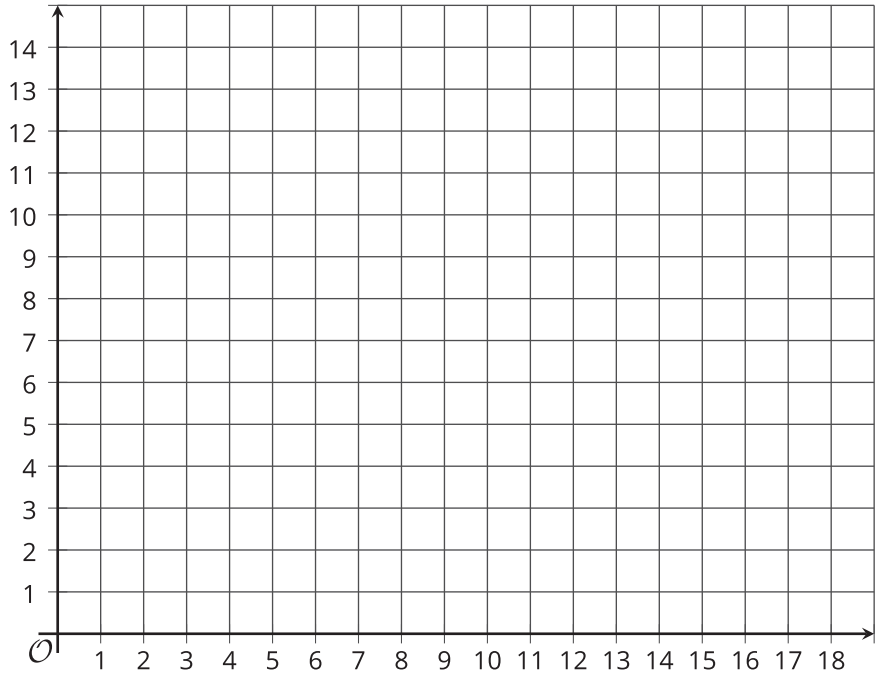
Shapes in the Coordinate Plane

Let's use the coordinate plane to solve problems and puzzles.

15.1 Figuring Out the Coordinate Plane

Draw a figure in the coordinate plane with at least three of the following properties:

- 6 vertices
- Exactly 1 pair of parallel sides
- At least 1 right angle
- 2 sides with the same length

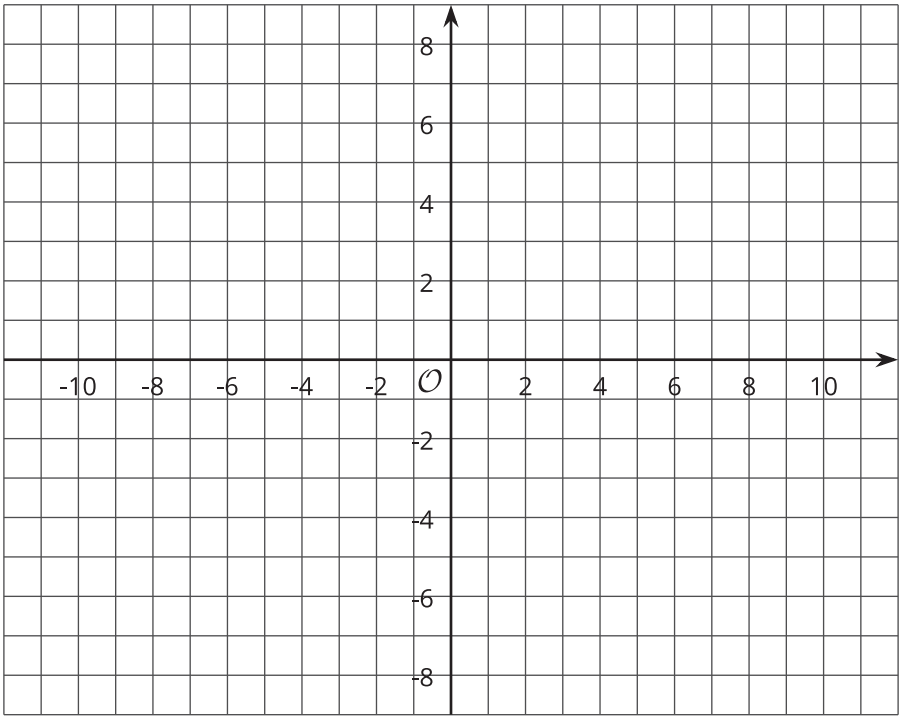


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15.2 Plotting Polygons

Here are the coordinates for four polygons. Plot them on the coordinate plane, connect the points in the order that they are listed, and label each polygon with its letter name.

1. Polygon A: $(-7, 4), (-8, 5), (-8, 6), (-7, 7), (-5, 7), (-5, 5), (-7, 4)$
2. Polygon B: $(4, 3), (3, 3), (2, 2), (2, 1), (3, 0), (4, 0), (5, 1), (5, 2), (4, 3)$
3. Polygon C: $(-8, -5), (-8, -8), (-5, -8), (-5, -5), (-8, -5)$
4. Polygon D: $(-5, 1), (-3, -3), (-1, -2), (0, 3), (-3, 3), (-5, 1)$



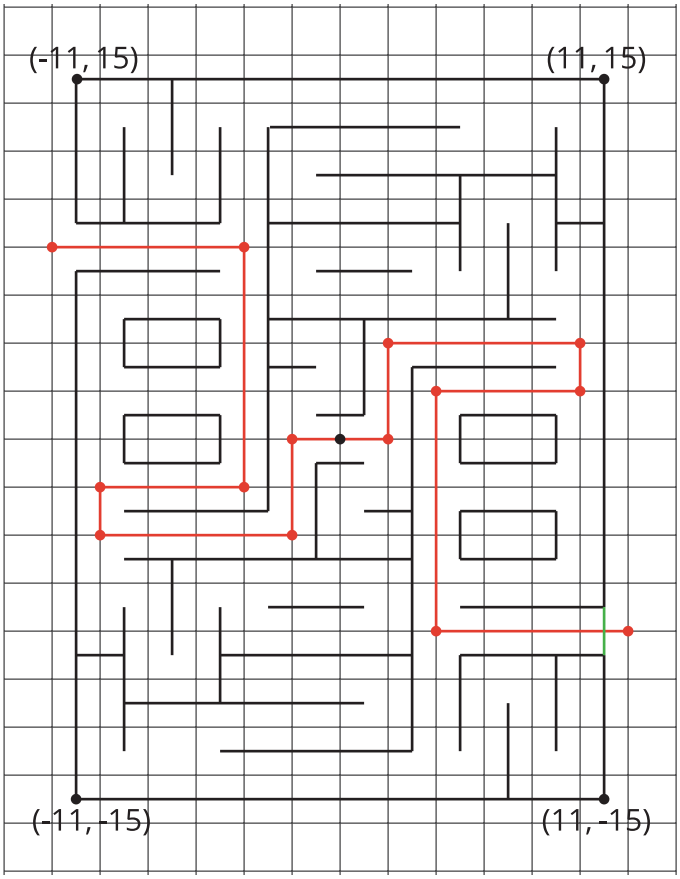
Are you ready for more?

Find the area of Polygon D in this activity.

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15.3 Four Quadrants of "a-MAZE-ing"

The diagram shows Andre's route through a maze. He started from the lower right entrance.

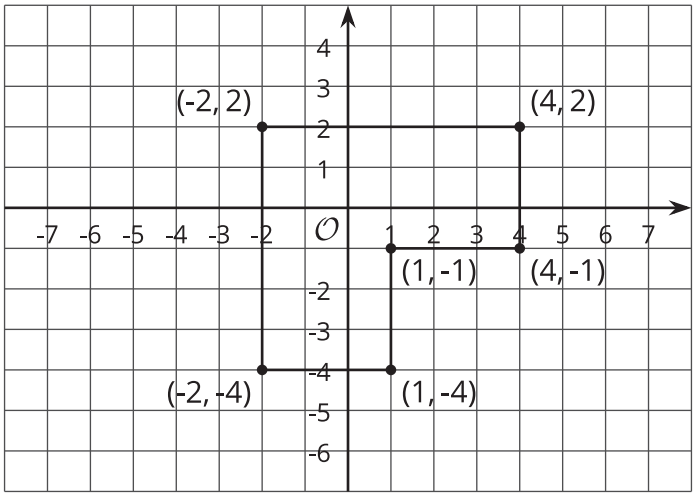


1. What are the coordinates of the first two and the last two points of his route?

2. How far did he walk from his starting point to his ending point? Explain or show your reasoning.

Lesson 15 Summary

Coordinates can be used to find the lengths of segments in the coordinate plane.



For example, we can find the perimeter of this polygon by finding the sum of its side lengths. Starting from $(-2, 2)$ and moving clockwise, we can see that the lengths of the segments are 6, 3, 3, 3, 3, and 6 units. The perimeter is therefore 24 units.

In general:

- If two points have the same x-coordinate, they will be on the same vertical line, and we can find the distance between them.
- If two points have the same y-coordinate, they will be on the same horizontal line, and we can find the distance between them.