

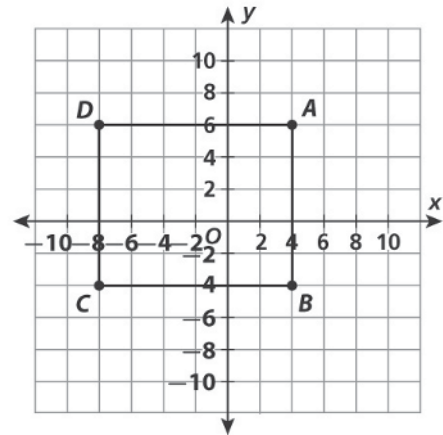
LESSON
14-2

Polygons in the Coordinate Plane

Reteach

Polygons are formed from three or more points, called *vertices*, that are connected by line segments and that enclose an area.

If the lengths of the sides are known, the area and perimeter of a polygon can be found. They can also be found if the coordinates of the vertices are known.



Find the Perimeter

First, identify the coordinates of the points that form the vertices of the polygon.

$$A: (4, 6); B: (4, -4); C: (-8, -4); D: (-8, 6)$$

Next, find the lengths of the sides.

$$AB = 10 \text{ units}$$

$$BC = 12 \text{ units}$$

$$CD = 10 \text{ units}$$

$$DA = 12 \text{ units}$$

Finally, add the lengths of the sides.

$$10 + 12 + 10 + 12 = 44$$

The perimeter of the polygon is 44 units.

Find the Area

First, identify the polygon. The figure is a rectangle, so its area is the product of its length and width.

Next, use the coordinates of the points to find the length and width.

$$AB = 10 \text{ units}$$

$$BC = 12 \text{ units}$$

Finally, multiply the length and width.

$$10 \times 12 = 120$$

The area of the polygon is 120 square units.

In this case, the area can also be found by counting the squares enclosed by the polygon. There are 30 squares.

How much area is represented by each square? 2×2 , or 4 square units.

The area is 30 cubes \times 4, or 120 square units.

Find the perimeter and area of the polygon enclosed by the points.

1. $(8, 6), (2, 6), (8, -5), \text{ and } (2, -5)$

Side lengths: _____

Perimeter: _____

Area: _____

2. $(0, 0), (0, 7), (7, 7), \text{ and } (7, 0)$

Side lengths: _____

Perimeter: _____

Area: _____