

# Chapter 9 Lesson 5

## Polygons of the Coordinate Plane

**Perimeter:** add the lengths of all the sides.

Area of a rectangle =  $l * w$       Area of a trapezoid =  $1/2h (b_1 + b_2)$

Find the **perimeter** using coordinates:

- Same x- coordinates, **SUBTRACT** their y-coordinates
- Same y – coordinates, **SUBTRACT** their x-coordinates

### EXAMPLES:

Use the coordinates to find the length of each side. Then find the perimeter of the rectangle.

$E(3, 6), F(3, 8), G(7, 8), H(7, 6)$

$\overline{EF} = 8 - 6 = 2$

$\overline{FG} = 7 - 3 = 4$

$\overline{GH} = 8 - 6 = 2$

$\overline{HE} = 7 - 3 = 4$

$2 + 4 + 2 + 4 = 12 \text{ units}$

The coordinates of the vertices of a garden are  $A(0, 1)$ ,  $B(0, 4)$ ,  $C(8, 4)$ , and  $D(8, 1)$ . If each unit represents 12 inches, find the perimeter in inches of the garden.

$\overline{AB} = 4 - 1 = 3$

$\overline{BC} = 8 - 0 = 8$

$\overline{CD} = 4 - 1 = 3$

$\overline{DA} = 8 - 0 = 8$

$3 + 8 + 3 + 8 = 22$

multiply units  
by 12 in  
since each  
unit is 12

$$\begin{array}{r} 22 \\ \times 12 \\ \hline 264 \text{ in} \end{array}$$

Find the area of a figure that has been drawn on grid paper or graphed in a coordinate plane.

Find the area of the figure in square units.

The figure can be separated into a rectangle and a trapezoid.

**Area of rectangle**

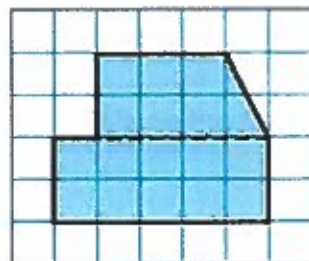
$$A = \ell \times w$$

$$A = 5 \times 2 \text{ or } 10$$

**Area of trapezoid**

$$A = \frac{1}{2}h(b_1 + b_2)$$

$$A = \frac{1}{2}(2)(3 + 4) \text{ or } 7$$



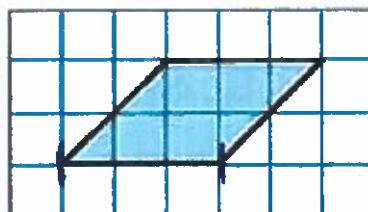
So, the area of the figure is  $10 + 7$  or 17 square units.

Find the area, in square units, of the figure at the right.

$$A = \ell \cdot w$$

$$A = 3 \cdot 2$$

$$A = 6 \text{ units}^2$$



Graph the figure and classify it. Then find the area.

e.  $A(3, 3), B(3, 6), C(5, 6), D(8, 3)$

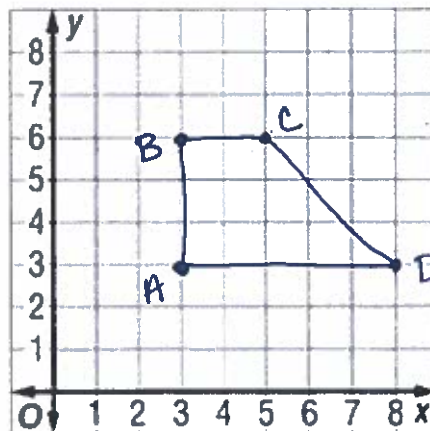
$$A = \frac{1}{2}h(b_1 + b_2)$$

$$A = \frac{1}{2}(3)(5 + 2)$$

$$A = \frac{1}{2}(3)(7)$$

$$A = \frac{1}{2}(21)$$

$$A = 10.5 \text{ units}^2$$



Trapezoid