

# Grid Space Builder

*Plot rectangles, then measure their space.*

**GRADE 6 • MA.6.GR.1.3**

**MA.6.GR.1.3** "Solve mathematical and real-world problems by plotting points on a coordinate plane, including finding the perimeter or area of a rectangle."

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## MEASURE ON THE GRID

Plot each vertex by moving across on the x-axis and up or down on the y-axis. For a rectangle, subtract x-coordinates to find the horizontal side and subtract y-coordinates to find the vertical side. Area is length x width, and perimeter is  $2 \times (\text{length} + \text{width})$ .

## WORKED EXAMPLE

A rectangle has vertices J(11, 12), K(11, 16), L(16, 16), and M(16, 12). Find its area and perimeter.

1. The horizontal side is  $16 - 11 = 5$  units.
2. The vertical side is  $16 - 12 = 4$  units.
3. Area =  $5 \times 4 = 20$  square units.
4. Perimeter =  $2 \times (5 + 4) = 18$  units.

**Answer: Area = 20 square units;  
perimeter = 18 units.**

## PRACTICE 6 problems

- 1** Plot point A(-3, 8). In which quadrant is point A?

**ANSWER** \_\_\_\_\_

- 2** Plot B(-6, 1) and C(7, 1). What is the horizontal distance from B to C?

**ANSWER** \_\_\_\_\_

- 3** Plot D(0, -8) and E(0, 2). What is the vertical distance from D to E?

**ANSWER** \_\_\_\_\_

- 4** Plot the vertices (1, 0), (1, 6), (9, 6), and (9, 0). Find the area of the rectangle.

**ANSWER** \_\_\_\_\_

- 5** Plot the vertices (-7, -2), (-7, 7), (3, 7), and (3, -2). Find the perimeter of the rectangle.

**ANSWER** \_\_\_\_\_

- 6** Three vertices of a rectangle are F(-8, 3), G(2, 3), and H(2, 13). What is the fourth vertex, and what is the area?

**ANSWER** \_\_\_\_\_

## APPLY IT Show your work

- 1** A skate club marks a rectangular practice zone on a coordinate map. The corners are  $(-9, -6)$ ,  $(-9, 8)$ ,  $(6, 8)$ , and  $(6, -6)$ . Each grid unit is 1 meter. What is the area of the practice zone?

WORK SPACE

ANSWER \_\_\_\_\_

- 2** A game designer maps a rectangular arena. Its corners are  $(2, -7)$ ,  $(2, 3)$ ,  $(10, 3)$ , and  $(10, -7)$ . How many units of barrier are needed to go around the arena?

WORK SPACE

ANSWER \_\_\_\_\_

## CHALLENGE One step up

### CHALLENGE

Two rectangular art panels are mapped on a coordinate plane. Panel R has corners  $(-8, -2)$ ,  $(-8, 8)$ ,  $(6, 8)$ , and  $(6, -2)$ . Panel S has corners  $(-3, -7)$ ,  $(-3, 7)$ ,  $(10, 7)$ , and  $(10, -7)$ . Which panel has the greater area, and how much greater is it?

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## PART 1 • PRACTICE

| # | PROBLEM                                                                                                             | ANSWER                                                 |
|---|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| 1 | Plot point A(-3, 8). In which quadrant is point A?                                                                  | <b>Quadrant II</b>                                     |
| 2 | Plot B(-6, 1) and C(7, 1). What is the horizontal distance from B to C?                                             | <b>13 units</b>                                        |
| 3 | Plot D(0, -8) and E(0, 2). What is the vertical distance from D to E?                                               | <b>10 units</b>                                        |
| 4 | Plot the vertices (1, 0), (1, 6), (9, 6), and (9, 0). Find the area of the rectangle.                               | <b>48 square units</b>                                 |
| 5 | Plot the vertices (-7, -2), (-7, 7), (3, 7), and (3, -2). Find the perimeter of the rectangle.                      | <b>38 units</b>                                        |
| 6 | Three vertices of a rectangle are F(-8, 3), G(2, 3), and H(2, 13). What is the fourth vertex, and what is the area? | <b>Fourth vertex: (-8, 13); area: 100 square units</b> |

## PART 2 • APPLY IT

1. **210 square meters** The horizontal side is 15 meters and the vertical side is 14 meters. Multiply  $15 \times 14$  to get 210 square meters.
2. **36 units** The side lengths are 8 units and 10 units. The perimeter is  $2 \times (8 + 10)$ , which equals 36 units.

## CHALLENGE

**Panel S has the greater area by 42 square units.**

Accept equivalent coordinate notation for the missing vertex and correct unit labels. For area, accept "square units," "square meters," or the matching abbreviation.