

6

Find Missing Dimensions of Rectangles

Lesson Planner

Objective

Find the missing dimension of a rectangle or square when other information about the shape is given.

Use this lesson after lesson 11-6 and Extend 11-6 to address standard M.TE.04.07 and M.TE.04.08.

Materials: grid paper, index cards

Activate Prior Knowledge

In previous lessons, students learned the area and perimeter formulas of rectangles.

- Ask students to recall the formula for the area of a rectangle. $A = \ell \times w$
- Then ask students to recall the formula for the perimeter of a rectangle.

$$P = \ell + \ell + w + w$$

Using student page MI36.

Students will need to use the area and perimeter formulas of rectangles to find missing dimensions of rectangles.

- Pass out index cards containing the length, width, area, or perimeter of a rectangle to students (one per student). Make sure that one length or width card matches with one area or perimeter card. For example, some of the cards matches may be: $\ell = 3$ inches and $A = 12$ square inches; $w = 5$ centimeters and $P = 18$ centimeters.

- Once students find their match, they must work together to find the missing length or width of their rectangle. Tell students to use either the area or perimeter formula of a rectangle to find the missing dimension.
- Discuss the answers and how they were found as a class.
- Work through the teach and Examples on student page 36.

Using the Exercises

Exercises 7–8 Remind students that the area formula of a square is $A = s \times s$ and that they can use the perimeter formula of a rectangle to find the perimeter of a square.

Assess and Close

Another Dimension Have students explain in writing how to find the missing dimension of a rectangle that has a length of 7 inches and an area of 42 square inches.

For Exercises 1-8, see Answer Appendix p. MI38.

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You can find the missing measure of a rectangle if you know the measure of the other side.

EXAMPLES

1 Find the width of the rectangle shown.



Area = 36 sq in.

Use the area formula of a rectangle to find its width.

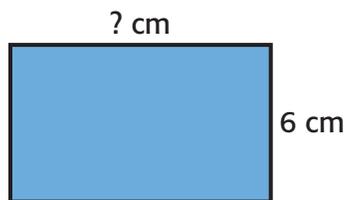
$$A = \ell \times w \quad \text{Area formula of a rectangle}$$

$$36 = 9 \times w \quad \text{Replace } \ell \text{ with 9.}$$

$$36 = 9 \times 4 \quad \text{Think: } 9 \times \square = 36?$$

So, the width is 4 inches.

2 Find the length of the rectangle shown.



Perimeter = 28 cm

Use the perimeter formula for a rectangle to find its length.

$$P = (2 \times \ell) + (2 \times w) \quad \text{Perimeter formula of a rectangle}$$

$$28 = (2 \times \ell) + (2 \times 6) \quad \text{Replace } w \text{ with 6.}$$

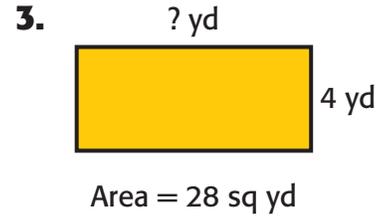
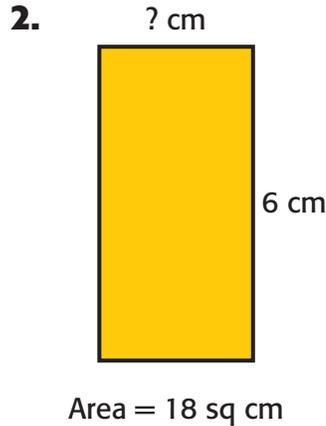
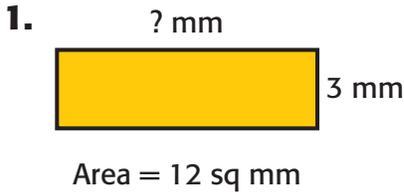
$$28 = (2 \times \ell) + 12 \quad \text{Multiply}$$

$$28 = 2 \times 8 + 12 \quad \text{Think: } 2 \times \square + 12 = 28?$$

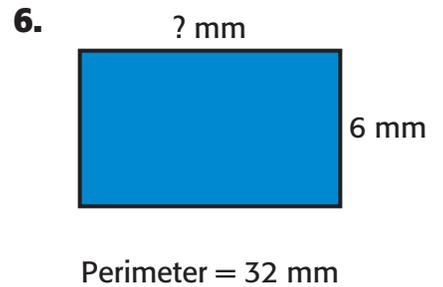
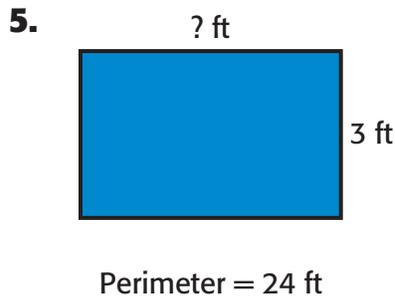
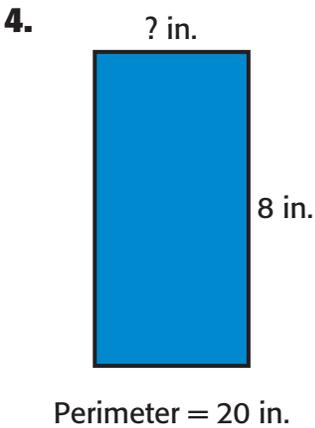
So, the length is 8 centimeters.

Exercises

The area and the measure of one side of each rectangle is given. Find the length of the missing side.



The perimeter and the measure of one side of each rectangle is given. Find the length of the missing side.



7. What is the measure of the sides of a square that has an area of 49 square feet?

8. What is the measure of the sides of a square that has a perimeter of 36 inches?