

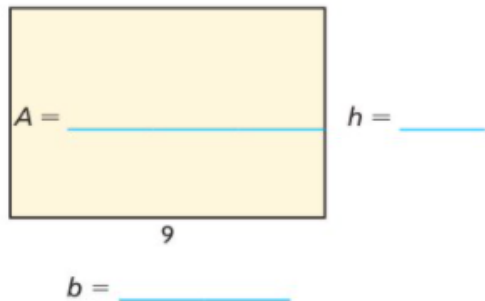
Name \_\_\_\_\_

**Find Unknown Measures****Essential Question** How can you find an unknown measure of a rectangle given its area or perimeter?Measurement and Data—  
4.MD.3**MATHEMATICAL PRACTICES**  
MP.2, MP.4, MP.7**Unlock the Problem**

Tanisha is painting a mural that is in the shape of a rectangle. The mural covers an area of 54 square feet. The base of the mural measures 9 feet. What is its height?

Use a formula for area.

- What do you need to find?  
\_\_\_\_\_
- What information do you know?  
\_\_\_\_\_

**Example 1** Find an unknown measure given the area.**MODEL** **Think:** Label the measures you know.  
Use  $n$  for the unknown.

So, the height of the mural is \_\_\_\_\_ feet.

**RECORD**

Use the model to write an equation and solve.

\_\_\_\_\_ = \_\_\_\_\_ Write the formula for area.

\_\_\_\_\_ = \_\_\_\_\_ Use the model to write an equation.

$$54 = 9 \times \underline{\hspace{1cm}}$$

The value of  $n$  is \_\_\_\_\_.**Think:**  $n$  is the height of the mural.**Math Talk****Mathematical Practices****Explain** how you can use division to find an unknown factor.

1. What if the mural were in the shape of a square with an area of 81 square feet? What would the height of the mural be? Explain.

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2. Explain how you can find an unknown side length of any square, when given only the area of the square.

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## Example 2 Find an unknown measure given the perimeter.

Gary is building an outdoor pen in the shape of a rectangle for his dog. He will use 24 meters of fencing. The pen will be 3 meters wide. How long will the pen be?



Use a formula for perimeter.

### MODEL

Think: Label the measures you know. Use  $n$  for the unknown.



$$w = \underline{\hspace{2cm}}$$

$$l = \underline{\hspace{2cm}}$$

$$P = \underline{\hspace{2cm}}$$

### RECORD

Use the model to write an equation and solve.

$$\begin{aligned} P &= (2 \times l) + (2 \times w) \\ \underline{\hspace{2cm}} &= (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) \\ \underline{\hspace{2cm}} &= (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) + \underline{\hspace{1cm}} \end{aligned}$$

Think:  $(2 \times n)$  is an unknown addend.

$$24 = \underline{\hspace{1cm}} + 6 \quad \text{Think: What is } 24 - 6?$$

The value of  $(2 \times n)$  is 18.

To find the value of  $n$ , find the unknown factor.

$$2 \times \underline{\hspace{1cm}} = 18$$

The value of  $n$  is  $\underline{\hspace{1cm}}$ .

Think:  $n$  is the length of the pen.

So, the pen will be  $\underline{\hspace{2cm}}$  long.



### ERROR Alert

Check that you are using the correct formula. Are you given the area or the perimeter?

**Try This!** The perimeter of a square is 24 feet. Find the side length.

Draw a model.

Write an equation.

$$P = 4 \times s$$

Name \_\_\_\_\_

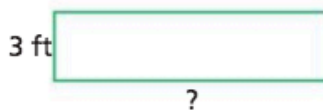
**Share and Show**

1. Find the unknown measure. The area of the rectangle is 36 square feet.

$$A = b \times h$$

$$\underline{\hspace{2cm}} = b \times \underline{\hspace{2cm}}$$

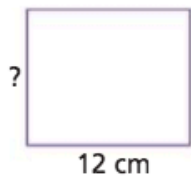
The base of the rectangle is \_\_\_\_\_.



**Find the unknown measure of the rectangle.**



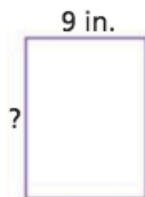
2.



Perimeter = 44 centimeters

width = \_\_\_\_\_

3.

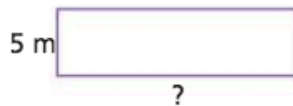


Area = 108 square inches

height = \_\_\_\_\_



4.



Area = 90 square meters

base = \_\_\_\_\_

**Math Talk****Mathematical Practices**

**Explain** how using the area formula helps you find the base of a rectangle when you know its area and height.

**On Your Own**

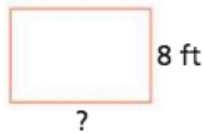
5.



Perimeter = 34 yards

length = \_\_\_\_\_

6.



Area = 96 square feet

base = \_\_\_\_\_

7.



Area = 126 square centimeters

height = \_\_\_\_\_



8. **GO DEEPER** A square has an area of 49 square inches. Explain how to find the perimeter of the square.

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