

Name \_\_\_\_\_ Date \_\_\_\_\_

## Using the Pythagorean Theorem

(Pages 404–407)

You can use the Pythagorean Theorem to find lengths of objects that have rectangular or right-triangular shapes.

### EXAMPLE

Marcia has a rectangular scarf that measures 36 inches by 48 inches. She folds it along the diagonal to make a right triangle. How long is the hypotenuse?

$$\begin{aligned} 36^2 + 48^2 &= d^2 && \text{Pythagorean Theorem} \\ 1,296 + 2,304 &= d^2 \\ 3,600 &= d^2 \\ 60 &= d \end{aligned}$$

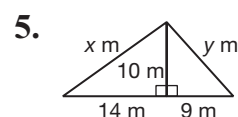
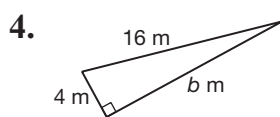
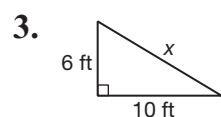
The hypotenuse is 60 inches long.

### Try These Together

- Determine the length of the second leg of a right triangle that has a hypotenuse of 50 inches and a leg of 40 inches.  
*HINT: Use the Pythagorean Theorem.*
- A table top is 3 feet by 4 feet. How long is its diagonal?  
*HINT: Draw a sketch. What kind of triangle does the diagonal make?*

### PRACTICE

Write an equation you could use to find the length of the missing side of each right triangle. Then solve. Round to the nearest tenth.



6. **Recreation** A sail on a ship is a right triangle. If one leg measures 30 feet and the other measures 16 ft, find the length of the hypotenuse of the sail.



7. **Standardized Test Practice** A right triangle has one leg that is 18 centimeters and a hypotenuse that is 30 centimeters. Find the length of the third side.

A 24 cm

B 48 cm

C 35 cm

D 540 cm

**Answers:** 1. 30 in. 2. 5 ft 3.  $6^2 + 10^2 = x^2; x = \sqrt{136} \approx 11.7$  ft 4.  $4^2 + 16^2 = b^2; b = \sqrt{240} \approx 15.5$  m 5.  $14^2 + 10^2 = x^2; x = \sqrt{296} \approx 17.2$  m;  $9^2 + 10^2 = y^2; y = \sqrt{181} \approx 13.5$  m 6. 34 ft 7. A