LESSON 9.4

NAME _____ DATE _____

Reteaching with Practice

For use with pages 551–557

GOAL **Find the side lengths of special right triangles**

VOCABULARY

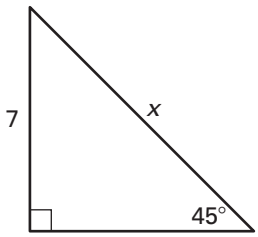
Right triangles whose angle measures are 45°- 45°- 90° or 30°- 60°- 90° are called **special right triangles.**

Theorem 9.8 The 45°- 45°- 90° Triangle Theorem
In a 45°- 45°- 90° triangle, the hypotenuse is $\sqrt{2}$ times as long as each leg.

Theorem 9.9 The 30°- 60°- 90° Triangle Theorem
In a 30°- 60°- 90° triangle, the hypotenuse is twice as long as the shorter leg, and the longer leg is $\sqrt{3}$ times as long as the shorter leg.

EXAMPLE 1 *Finding Side Lengths in a 45°-45°-90° Triangle*

Find the value of x.



SOLUTION

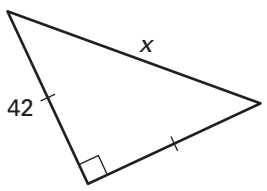
By the Triangle Sum Theorem, the measure of the third angle is 45°. The triangle is a 45°- 45°- 90° right triangle, so the length x of the hypotenuse is $\sqrt{2}$ times the length of a leg.

Hypotenuse $= \sqrt{2} \cdot$ leg	45°- 45°- 90° Triangle Theorem
$x = \sqrt{2} \cdot 7$	Substitute.
$x = 7\sqrt{2}$	Simplify.

Exercises for Example 1

Find the value of each variable.

1.



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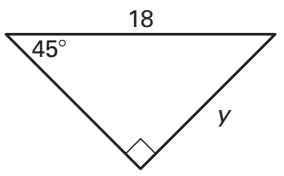

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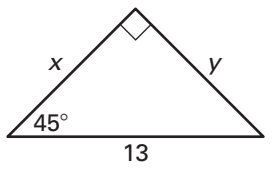

Lesson 9.4

LESSON 9.4 CONTINUED

NAME _____ DATE _____

Reteaching with Practice

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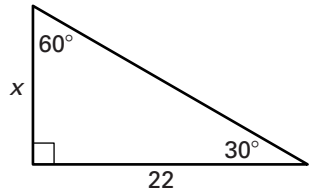
EXAMPLE 2 Finding Side Lengths in a 30°-60°-90° Triangle

Find the value of x.



SOLUTION

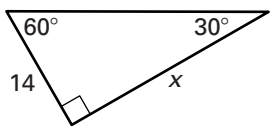
Because the triangle is a 30°- 60°- 90° triangle, the longer leg is $\sqrt{3}$ times the length x of the shorter leg.

Longer leg $= \sqrt{3} \cdot$ shorter leg	30°- 60°- 90° Triangle Theorem
$22 = \sqrt{3} \cdot x$	Substitute.
$\frac{22}{\sqrt{3}} = x$	Divide each side by $\sqrt{3}$.
$\frac{\sqrt{3}}{\sqrt{3}} \cdot \frac{22}{\sqrt{3}} = x$	Multiply numerator and denominator by $\sqrt{3}$.
$\frac{22\sqrt{3}}{3} = x$	Simplify.

Exercises for Example 2

Find the value of each variable.

4.



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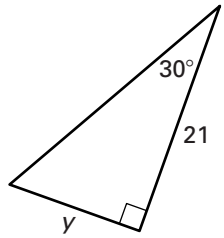

6.