LESSON 9.6

NAME _____ DATE _____

Practice with Examples

For use with pages 567–572

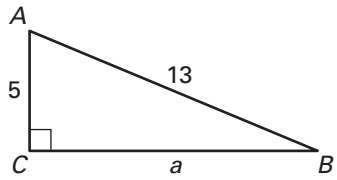
GOAL **Solve a right triangle**

VOCABULARY

To **solve a right triangle** means to determine the measures of all six parts.

EXAMPLE 1 ***Solving a Right Triangle***

Solve the right triangle.



SOLUTION

Begin by using the Pythagorean Theorem to find the length of the missing side.

$(\text{hypotenuse})^2 = (\text{leg})^2 + (\text{leg})^2$	Pythagorean Theorem
$13^2 = a^2 + 5^2$	Substitute.
$169 = a^2 + 25$	Multiply.
$144 = a^2$	Subtract 25 from each side.
$12 = a$	Find the positive square root.

Then find the measure of $\angle B$.

$$\tan B = \frac{\text{opp.}}{\text{adj.}}$$

$$\tan B = \frac{5}{12} \qquad \text{Substitute.}$$

$$m\angle B \approx 22.6^\circ \qquad \text{Use a calculator.}$$

Finally, because $\angle A$ and $\angle B$ are complements, you can write $m\angle A = 90^\circ - m\angle B \approx 90^\circ - 22.6^\circ = 67.4^\circ$.

The side lengths of ΔABC are 5, 12, and 13. ΔABC has one right angle and two acute angles whose measures are about 22.6° and 67.4°.

Chapter 9

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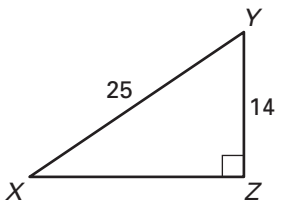
Practice with Examples

For use with pages 567–572

Exercises for Example 1

Solve the right triangle.

1.



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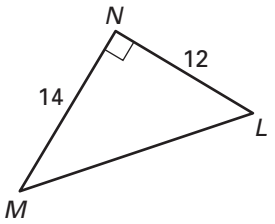

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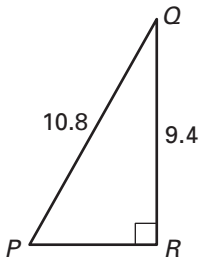
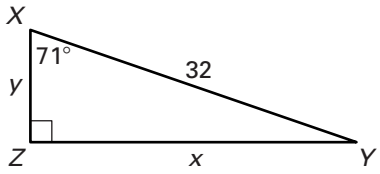


EXAMPLE 2 Solving a Right Triangle

Solve the right triangle.



SOLUTION

Use trigonometric ratios to find the values of x and y.

$$\sin X = \frac{\text{opp.}}{\text{hyp.}} \qquad \cos X = \frac{\text{adj.}}{\text{hyp.}}$$

$$\sin 71^\circ = \frac{x}{32} \qquad \cos 71^\circ = \frac{y}{32}$$

$$32 \sin 71^\circ = x \qquad 32 \cos 71^\circ = y$$

$$32(0.9455) = x \qquad 32(0.3256) = y$$

$$30.3 \approx x \qquad 10.4 \approx y$$

Because $\angle X$ and $\angle Y$ are complements, you can write

$m\angle Y = 90^\circ - m\angle x = 90^\circ - 71^\circ = 19^\circ$.

The side lengths of the triangle are about 10.4, 30.3, and 32. The triangle has one right angle and two acute angles whose measures are 71° and 19°.

LESSON 9.6 CONTINUED

NAME _____ DATE _____

Practice with Examples

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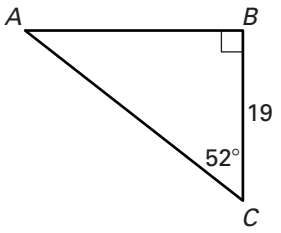
Exercises for Example 2

Solve the right triangle.

4.



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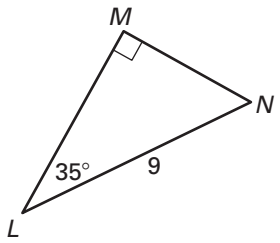

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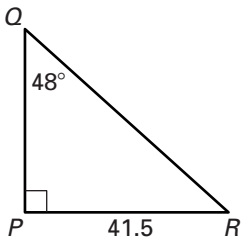

Chapter 9