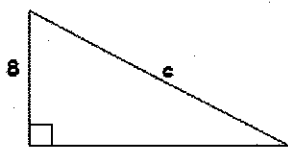


January 29, 2014

## 8.2 Warm-Up

Solve for each variable.

1.



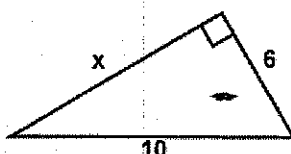
$$8^2 + 6^2 = c^2$$

$$64 + 36 = c^2$$

$$\sqrt{100} = \sqrt{c^2}$$

$$\boxed{c = 10}$$

2.



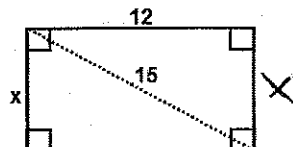
$$6^2 + x^2 = 10^2$$

$$36 + x^2 = 100$$

$$\sqrt{x^2} = \sqrt{64}$$

$$\boxed{x = 8}$$

3.



$$12^2 + x^2 = 15^2$$

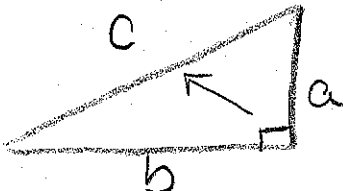
$$144 + x^2 = 225$$

$$\sqrt{x^2} = \sqrt{81}$$

$$\boxed{x = 9}$$

## 8.2 The Pythagorean Theorem and Its Converse

Target: Use the Pythagorean theorem and its converse to solve problems

Pythagorean Theorem	Converse of the Pythagorean Theorem
$a^2 + b^2 = c^2$ 	$a^2 + b^2 = c^2 \rightarrow \text{Right}$ $a^2 + b^2 < c^2 \rightarrow \text{obtuse}$ $a^2 + b^2 > c^2 \rightarrow \text{Acute}$ $\boxed{a + b > c} \quad c = \text{largest number}$

Determine whether each set of numbers can be the measures of the sides of a triangle. If so, classify the triangle as *acute*, *right*, or *obtuse*. Justify your answer.

a. 7, 14, 16

$$7 + 14 > 16$$

$$21 > 16 \text{ yes}$$

$$7^2 + 14^2 = 16^2$$

$$49 + 196 = 256$$

$$\text{obtuse } \boxed{245 < 256}$$

b. 9, 40, 41

$$9 + 40 > 41$$

$$49 > 41 \text{ yes}$$

$$9^2 + 40^2 = 41^2$$

$$81 + 1600 = 1681$$

$$\boxed{1681 = 1681}$$

Right

c. 11, 60, 61

$$11 + 60 > 61$$

$$71 > 61 \text{ yes}$$

$$11^2 + 60^2 = 61^2$$

$$121 + 3600 = 3721$$

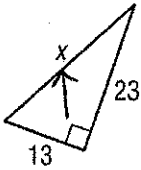
$$\boxed{3721 = 3721} \text{ Right}$$

# 8-2 Practice

## The Pythagorean Theorem and Its Converse

Find  $x$ .

1.



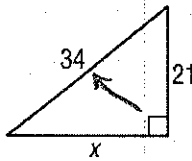
$$13^2 + 23^2 = x^2$$

$$169 + 529 = x^2$$

$$\sqrt{698} = \sqrt{x^2}$$

$$x = 26.4$$

2.



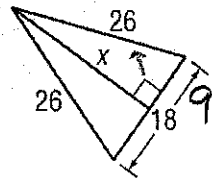
$$21^2 + x^2 = 34^2$$

$$441 + x^2 = 1156$$

$$\sqrt{x^2} = \sqrt{715}$$

$$x = 26.71$$

3.



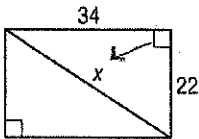
$$9^2 + x^2 = 26^2$$

$$81 + x^2 = 676$$

$$\sqrt{x^2} = \sqrt{595}$$

$$x = 24.41$$

4.



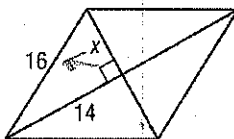
$$22^2 + 34^2 = x^2$$

$$484 + 1156 = x^2$$

$$\sqrt{1640} = \sqrt{x^2}$$

$$x = 40.5$$

5.



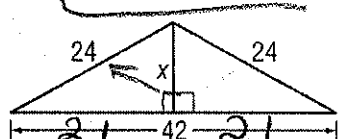
$$x^2 + 14^2 = 16^2$$

$$x^2 + 196 = 256$$

$$\sqrt{x^2} = \sqrt{60}$$

$$x = 7.71$$

6.



$$21^2 + x^2 = 24^2$$

$$441 + x^2 = 576$$

$$\sqrt{x^2} = \sqrt{135}$$

$$x = 11.61$$

Determine whether each set of numbers can be measure of the sides of a triangle. If so, classify the triangle as acute, obtuse, or right. Justify your answer.

7. 10, 11, 20

$$10 + 11 > 20$$

$$21 > 20 \text{ yes}$$

$$10^2 + 11^2 = 20^2$$

$$100 + 121 = 400$$

$$221 < 400 \text{ obtuse}$$

9. 21.5, 24, 55.5

$$21.5 + 24 > 55.5$$

$$45.5 > 55.5 \text{ no}$$

$$\text{not a triangle}$$

8. 12, 14, 49

$$12 + 14 > 49$$

$$26 > 49$$

$$\text{not a triangle}$$

10. 30, 40, 50

$$30 + 40 > 50$$

$$70 > 50 \text{ yes}$$

$$30^2 + 40^2 = 50^2$$

$$900 + 1600 = 2500$$

$$2500 = 2500$$

$$\text{Right}$$

11. CONSTRUCTION The bottom end of a ramp at a warehouse is 10 feet from the base of the main dock and is 11 feet long. How high is the dock?

$$10^2 + x^2 = 11^2$$

$$100 + x^2 = 121$$

$$\sqrt{x^2} = \sqrt{21}$$

$$x = 4.61$$

