

**?**

**W2K**

D. a triangle having an interior angle measuring 90 degrees

perfect square

C. in a right triangle, either of the two sides forming the right angle

hypotenuse

B. a number that is the result of squaring a natural, or whole, number

right triangle

A. the side of a right triangle that is opposite the right angle; always the longest side

leg

**Words to Know**

*Write the letter of the definition next to the matching word as you work through the lesson. You may use the glossary to help you.*

squares.

**Recognize** that non- perfect square roots

can be approximated.

**Evaluate** square

roots of

theorem to solve for the unknown

value.

**Use** the

**Find** the hypotenuse of a right triangle.

**Lesson Goals**

**Lesson Question**



### Perfect Square Numbers

* A number that can be produced by multiplying an integer by is known as a **perfect square**.
* For example, the number 9 can be produced by multiplying the positive integer 3 by itself: (3 × 3) = 9.
* The number 12, however, cannot be produced this way, so it is not a square.

Are the following numbers perfect squares?

* + 4 = (2 × 2) =
  + 25 = ( × ) = 52
  + 50 = not a perfect square

**Slide**

### Longest Side of a Right Triangle

A **right triangle** is a triangle that contains one right angle. The sides that make up the right angle are the **legs,** and the side the right angle is

the **hypotenuse**. The hypotenuse is always the side of a right triangle.

*c*2 = *a*2 + *b*2

A A

leg

hypotenuse *b c*

C leg B

**2**

C *a* B

**Slide**

### Using the Pythagorean Theorem to Find the Hypotenuse

#### EXAMPLE

Use the Pythagorean theorem to find the length of the hypotenuse, *c*.

A Pythagorean theorem: *a*2 + *b*2 = *c*2

24 ft *c*

72 + 242 = *c*2

+ 576 = *c*2

= *c*2

C 7 ft B

625  *c*2

± 25 = *c*

**2**



*c* = ft

Distance is always positive.

**Slide**

### The Pythagorean Theorem and Distance

#### REAL-WORLD CONNECTION

To get to the local coffee shop, Van left his house, walked 3 blocks south, and then walked 4 blocks west.

**Van’s House**

**3 blocks south**

**Coffee Shop**

**4 blocks west**

When he got to the coffee shop, Van realized he could take a more direct route home. How many blocks will Van have to walk to get home from the coffee shop if he takes the most direct route?

**4**



*a*2 + *b*2 = *c*2

32 + 42 = *c*2

+ 16 = *c*2

= *c*2

 25  *c*

= *c*

5 blocks

**Slide**

 13  *c*

13  *c*

C 3 in. B

= *c*2

+ 4 = *c*2

= *c*2

*c* =

2 in.

32 +

*a*2 + *b*2 = *c*2

A

**Finding the Length of a Non-Perfect Hypotenuse**

**EXAMPLE**

Use the Pythagorean theorem to find the length of the hypotenuse, *c*.

**7**

**10**



ft

*c* ≈

Use a calculator to give an approximate number for the length.

*c*2

178 

178  *c*

3 ft

9 + = *c*2

13 ft

*c*

32 + 132 = *c*2

**Finding the Length of a Ladder**

**REAL-WORLD CONNECTION**

Robert wants to hang a picture above his entertainment center. How long must a ladder be to reach a height of 13 feet if the bottom of the ladder is placed 3 feet from the base of the wall?

*a*2 + *b*2 = *c*2

**Slide**

### Right Triangles and Measures

#### REAL-WORLD CONNECTION

Jenna is shopping for a new computer monitor. If she knows the measurements of the sides of the monitor, how can she figure out the diagonal measurement?

11 in.

*c*

14 in.

*a*2 + *b*2 = *c*2

+ 142 = *c*2

## 121 + = *c*2

317 = *c*2

The diagonal split the rectangle into 2 right triangles.

317

317

 *c*2

 *c*

Use the theorem.

**12**



*c* ≈ in.

# Summary

**Lesson Question**

**??**

## Finding the Hypotenuse in Right Triangles



How can you find the length of the hypotenuse of a right triangle?

**Lesson Question**

**Answer**

*Use this space to write any questions or thoughts about this lesson.*