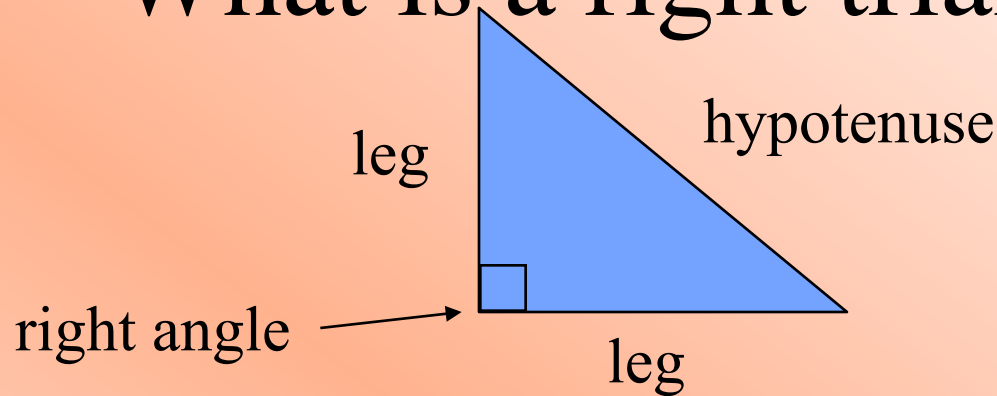


Objective

The student will be able to:

use the Pythagorean Theorem

What is a right triangle?



It is a triangle which has an angle that is **90** degrees.

The two sides that make up the right angle are called legs.

The side opposite the right angle is the hypotenuse.

The Pythagorean Theorem

In a right triangle, if a and b are the measures of the legs and c is the hypotenuse, then

$$\mathbf{a^2 + b^2 = c^2.}$$

Note: The hypotenuse, c , is always the longest side.

Find the length of the hypotenuse if

1. $a = 12$ and $b = 16$.

$$12^2 + 16^2 = c^2$$

$$144 + 256 = c^2$$

$$400 = c^2$$

Take the square root of both sides.

$$\sqrt{400} = \sqrt{c^2}$$

$$**20 = c**$$

Find the length of the hypotenuse if

2. $a = 5$ and $b = 7$.

$$5^2 + 7^2 = c^2$$

$$25 + 49 = c^2$$

$$74 = c^2$$

Take the square root of both sides.

$$\sqrt{74} = \sqrt{c^2}$$

$$**8.60 = c**$$

Find the length of the hypotenuse
given $a = 6$ and $b = 12$

1. 180

2. 324

✓ 3. 13.42

4. 18

Find the length of the leg, to the nearest hundredth, if

3. $a = 4$ and $c = 10$.

$$4^2 + b^2 = 10^2$$

$$16 + b^2 = 100$$

Solve for b .

$$16 - \mathbf{16} + b^2 = 100 - \mathbf{16}$$

$$b^2 = 84$$

$$\sqrt{b^2} = \sqrt{84}$$

$$\mathbf{b = 9.17}$$

Find the length of the leg, to the nearest hundredth, if

4. $c = 10$ and $b = 7$.

$$a^2 + 7^2 = 10^2$$

$$a^2 + 49 = 100$$

Solve for a .

$$a^2 = 100 - 49$$

$$a^2 = 51$$

$$\sqrt{a^2} = \sqrt{51}$$

$$\mathbf{a = 7.14}$$

Find the length of the missing side
given $a = 4$ and $c = 5$

1. 1

✓ 2. 3

3. 6.4

4. 9

5. The measures of three sides of a triangle are given below. Determine whether each triangle is a right triangle.

$$\sqrt{73}, 3, \text{ and } 8$$

Which side is the biggest?

The square root of 73 (= 8.5)! This must be the hypotenuse (c).

Plug your information into the Pythagorean Theorem. It doesn't matter which number is a or b.

Sides: $\sqrt{73}$, 3, and 8

$$3^2 + 8^2 = (\sqrt{73})^2$$

$$9 + 64 = 73$$

$$73 = 73$$

Since this is true, the triangle is a right triangle!! If it was not true, it would not be a right triangle.

Determine whether the triangle is a right triangle given the sides 6, 9, and $\sqrt{45}$

- ✓ 1. Yes
- 2. No
- 3. Purple