Skill check:

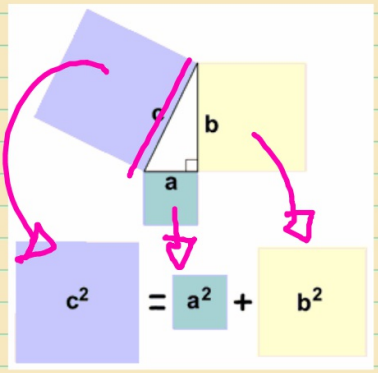
Use three ways to describe a triangle

7-3
Pythagorean Theorem

Meaning of Pythagorean Theorem

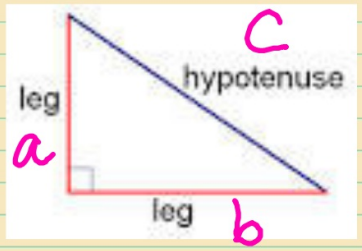
In any right triangle, the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse.

Algebra meaning



Vocabulary

Legs



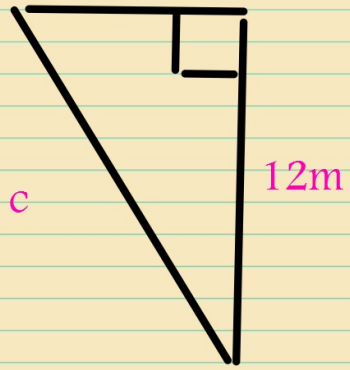
The legs of the triangle form a 90 degree angle

Hypotenuse

The hypotenuse is vertically across from the right angle

Example 1

Find the length of the hypotenuse of the triangle

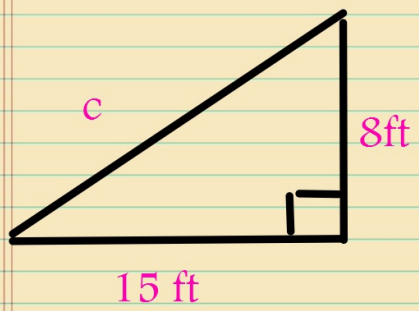


Find the length of the hypotenuse of the triangle.

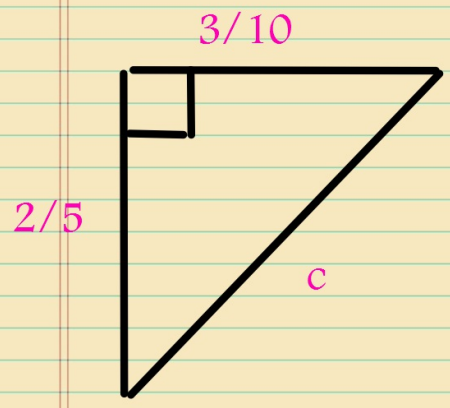
$a^2 + b^2 = c^2$	Write the Pythagorean Theorem.
$5^2 + 12^2 = c^2$	Substitute 5 for a and 12 for b.
$25 + 144 = c^2$	Evaluate powers.
$169 = c^2$	Add.
$\sqrt{169} = \sqrt{c^2}$	Take positive square root of each side.
$13 = c$	Simplify.

∴ The length of the hypotenuse is 13 meters.

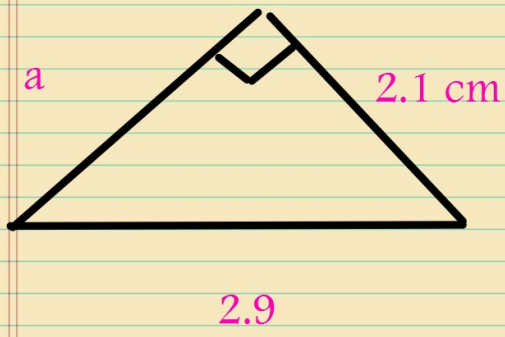
Practice



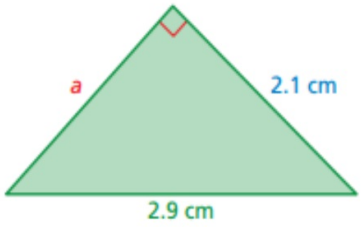
Practice



Example 2
Finding the length of a leg



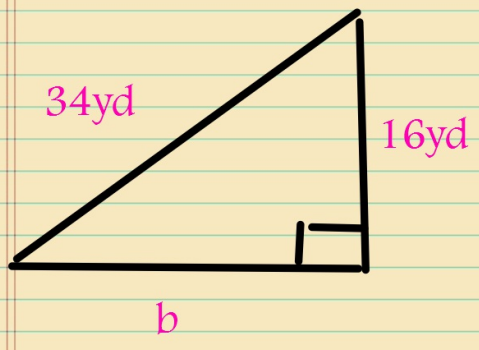
Find the missing length of the triangle.



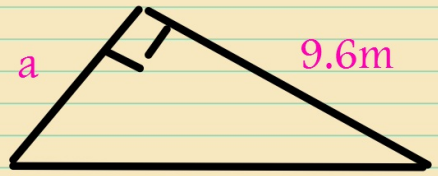
$a^2 + b^2 = c^2$	Write the Pythagorean Theorem.
$a^2 + 2.1^2 = 2.9^2$	Substitute 2.1 for b and 2.9 for c.
$a^2 + 4.41 = 8.41$	Evaluate powers.
$a^2 = 4$	Subtract 4.41 from each side.
$a = 2$	Take positive square root of each side.

∴ The missing length is 2 centimeters.

Practice



Practice



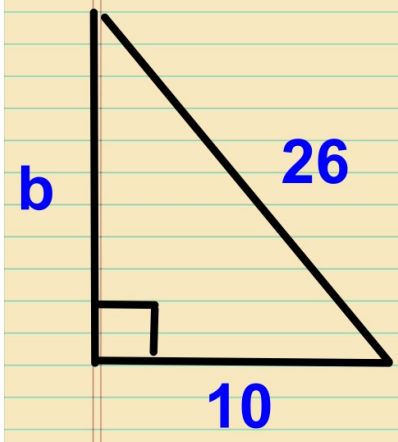
Challenge

You are playing capture the flag. You are 50 yards north and 20 yards east of your teams base. The other team's base is 80 yards north and 60 yards east of your base. How far are you from the other team's base?

1.) Draw a picture

2.) identify the right angle

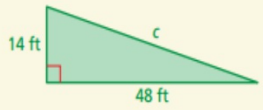
Skill check



Mini-Assessment

Find the missing length of the triangle.

1. 50 ft



2. 24 mm

3. 12 in.