

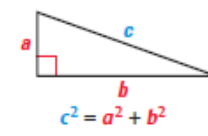
7.1 Apply the Pythagorean Theorem



Before You learned about the relationships within triangles.

Now You will find side lengths in right triangles.

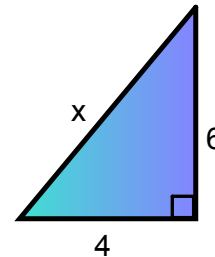
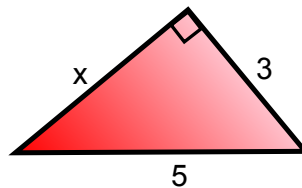
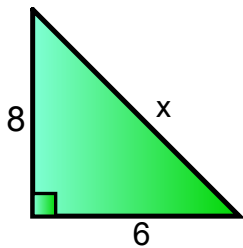
Why? So you can find the shortest distance to a campfire, as in Ex. 35.

THEOREM	<i>For Your Notebook</i>
THEOREM 7.1 Pythagorean Theorem	
In a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.	

Example 1:

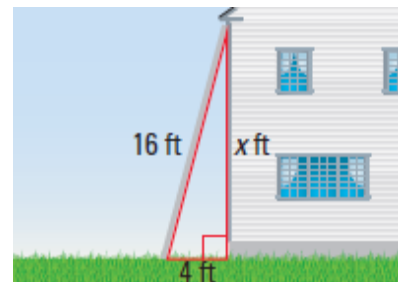
Find the missing length and identify the unknown side as a *leg* or *hypotenuse*.

Write your answer in simplest radical form.



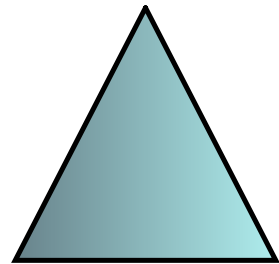
Example 2:

A 16 foot ladder rests against the side of the house, and the base of the ladder is 4 feet away. Approximately how high above the ground is the top of the ladder?



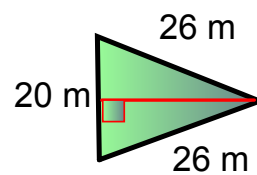
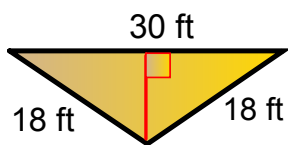
Example 3:

Find the area of an isosceles triangle with side lengths 10 meters, 13 meters, and 13 meters.



Example 4:

Find the area of the triangles.



Pythagorean Triple: A set of three positive _____ a, b, and c that satisfy the equation $c^2 = a^2 + b^2$

KEY CONCEPT		<i>For Your Notebook</i>	
Common Pythagorean Triples and Some of Their Multiples			
3, 4, 5	5, 12, 13	8, 15, 17	7, 24, 25
6, 8, 10	10, 24, 26	16, 30, 34	14, 48, 50
9, 12, 15	15, 36, 39	24, 45, 51	21, 72, 75
30, 40, 50	50, 120, 130	80, 150, 170	70, 240, 250
3x, 4x, 5x	5x, 12x, 13x	8x, 15x, 17x	7x, 24x, 25x

The most common Pythagorean triples are in bold. The other triples are the result of multiplying each integer in a bold face triple by the same factor.

Example 5:

Find the length of the hypotenuse by using TWO different methods.

