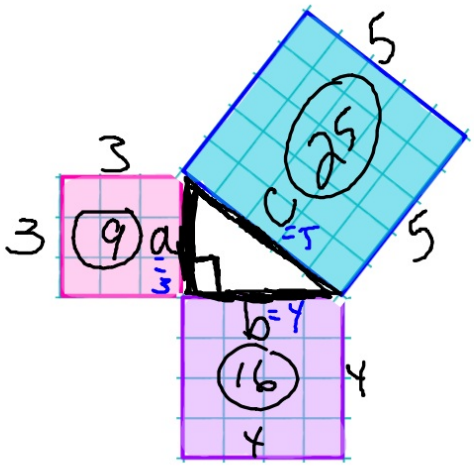
A = lw
(3)(3)
9



A = lw
(4)(4)
16

A = lw
(5)(5)
25

Pythagorean Theorem Proof

$a^2 + b^2 = c^2$

$3^2 + 4^2 = 5^2$

$9 + 16 = 25$

$25 = 25$ ✓

Verify that segments with lengths of 4.3 feet, 5.2 feet, and 6.1 feet form a triangle. Is the triangle *acute*, *right*, or *obtuse*?

SOLUTION $c^2=a^2+b^2$ (right triangle)

Step 1 Use the Triangle Inequality Theorem (Theorem 6.11) to verify that the segments form a triangle.

$4.3 + 5.2 \stackrel{?}{>} 6.1$ $\quad$ $4.3 + 6.1 \stackrel{?}{>} 5.2$ $\quad$ $5.2 + 6.1 \stackrel{?}{>} 4.3$

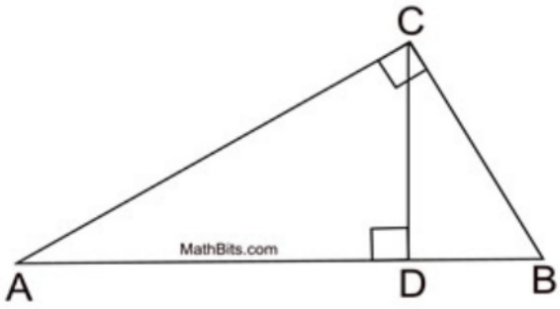
$9.5 > 6.1$ ✓ $\quad$ $10.4 > 5.2$ ✓ $\quad$ $11.3 > 4.3$ ✓

▶ The segments with lengths of 4.3 feet, 5.2 feet, and 6.1 feet form a triangle.

$c^2<a^2+b^2$ (acute triangle) $\quad$ $c^2>a^2+b^2$ (obtuse triangle)

Step 2 Classify the triangle by comparing the square of the length of the longest side with the sum of the squares of the lengths of the other two sides.

acute triangle.

6. Verify that segments with lengths of 3, 4, and 6 form a triangle. Is the triangle *acute*, *right*, or *obtuse*?

THEOREM: The altitude to the hypotenuse of a right triangle forms two triangles that are similar to each other and to the original triangle.