Name: _____ Date: _____

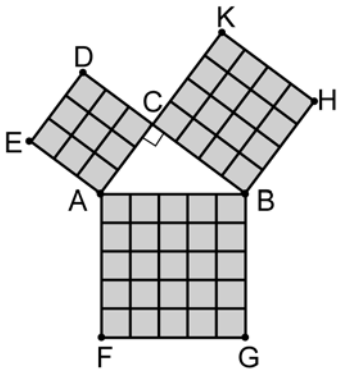
Skill and Practice

5C Pythagorean Theorem

Read:

The Pythagorean theorem states that the sum of the squares of the lengths of the legs of a right triangle is equal to the square of the hypotenuse. The following expression represents the Pythagorean theorem:

$a^2 + b^2 = c^2$ where c is the hypotenuse of a right triangle and a and b are the measures of the legs.



Geometrically, this theorem is that the area of *ABGF* in the figure at right is equal to the sum of the areas of *ACDE* and *BCKH*.

Examples:

Use the Pythagorean theorem expression ($a^2 + b^2 = c^2$) to solve the following problems.

Example 1: What is the length of c if $a = 6$ and $b = 8$?	$6^2 + 8^2 = c^2$ $36 + 64 = c^2$ $100 = c^2$ $\sqrt{100} = \sqrt{c^2}$ $10 = c$
Example 2: What is the length of a if $b = 5\sqrt{3}$ and $c = 10$?	$a^2 + (5\sqrt{3})^2 = 10^2$ $a^2 + 75 = 100$ $a^2 = 25$ $\sqrt{a^2} = \sqrt{25}$ $a = 5$

Skill and Practice

Practice:

All of the following values apply to right triangles. Find the measure of the missing side of the triangle using the Pythagorean theorem. If the measure has a square root (like $\sqrt{3}$) leave it in the answer.

1.	a = 5	b = 12	c =
2.	a =	b = 15	c = 17
3.	a = 7	b =	c = 25
4.	a =	b = 4	c = $4\sqrt{2}$
5.	a = $8\sqrt{3}$	b = 8	c =
6.	a = 15	b = 20	c =