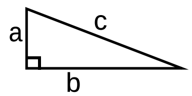
Pythagorean Theorem

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

or



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

Using the triangle given, find the missing side. (Simplest radical form- NO DECIMALS!)

1) a = 2, b = ________, c = 5

$a^2 + b^2 = c^2$	
$(2)^2 + b^2 = (5)^2$	Plug in the values of the variables given.
$4 + b^2 = 25$	Simplify.
$-4 \qquad -4$	Solve for b^2
$b^2 = 21$	
$\sqrt{b^2} = \sqrt{21}$	To solve, square root both sides of the equation.
$\boxed{b = \sqrt{21}}$	Since 21 is an acceptable radicand, we do not need to simplify.

2) a = 7, b= 17, c = ________

$a^2 + b^2 = c^2$	
$(7)^2 + (17)^2 = c^2$	Plug in the values of the variables given.
$49 + 289 = c^2$	Simplify.
$338 = c^2$	Simplify.
$\sqrt{388} = \sqrt{c^2}$	To solve, square root both sides of the equation.
$\sqrt{4 \bullet 97} = c$	Simplify the square root.
$\sqrt{(2)^2 \bullet 97} = c$	
$\boxed{2\sqrt{97} = c}$	

Determine whether the lengths given can form a right triangle.

3) 3, 4, 5

$a^2 + b^2 = c^2$	The longest side of a triangle is the hypotenuse. So c = 5. It doesn't matter which one is a and which is b.
$(3)^2 + (4)^2 = (5)^2$	
$9 + 16 = 25$	Simplify.
$25 = 25$	TRUE statement means, YES it can form a right triangle.
YES	

4) 5, 11, 9

$a^2 + b^2 = c^2$	The longest side of a triangle is the hypotenuse. So c = 11. It doesn't matter which one is a and which is b.
$(5)^2 + (9)^2 = (11)^2$	
$25 + 81 = 121$	Simplify.
$106 \neq 121$	FALSE statement means, NO it can NOT form a right triangle.
NO	