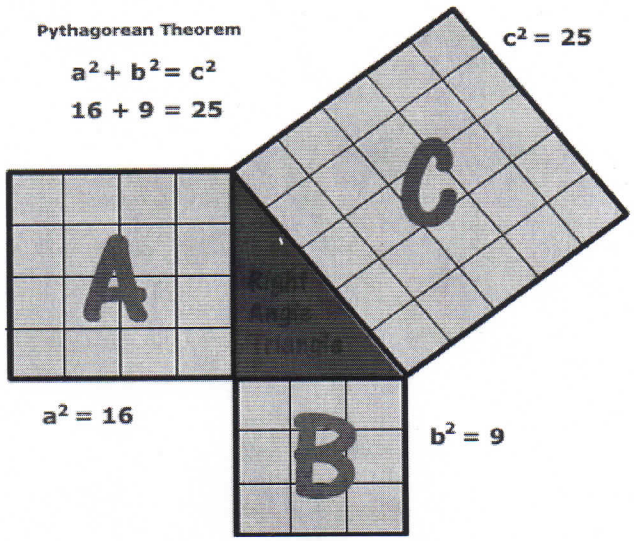
Pythagorean Theorem

Date Notes.

RELATION:

For any right angled triangle, the area of a square placed on the longest side of the triangle is equal to the sum of the areas of the squares placed on the other two sides.

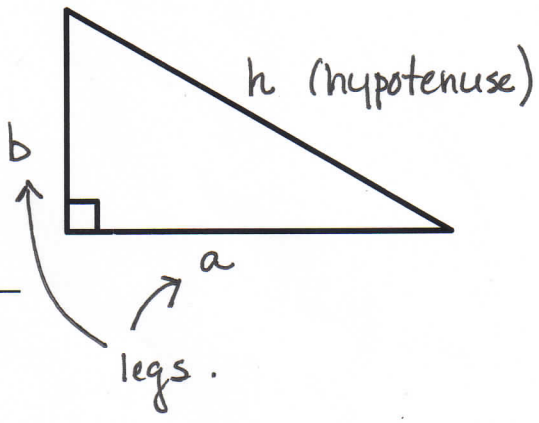


Area of C = Area of A + Area of B.

C is the longest side of a right angled triangle.

It is called the hypotenuse and is opposite of the right angle.

The other two sides are called legs and labeled a & b



PYTHAGOREAN THEOREM FORMULA

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

This ONLY works for right angled triangles.

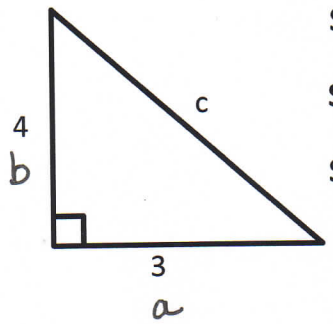
Pythagorean Theorem

Date Notes

EXAMPLES:

1. Calculate the unknown side for each right angled triangle.

a)



Step 1: Label your sides starting with c, then a and b

Step 2: Substitute your values into the formula ($c^2 = a^2 + b^2$)

Step 3: Rearrange the formula to solve the unknown side

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

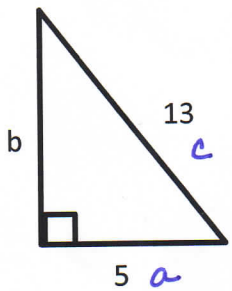
$c^2 = 3^2 + 4^2$

$c^2 = 9 + 16$

$\sqrt{c^2} = \sqrt{25}$ → square both sides.

$c = 5$

b)



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

$13^2 = 5^2 + b^2$

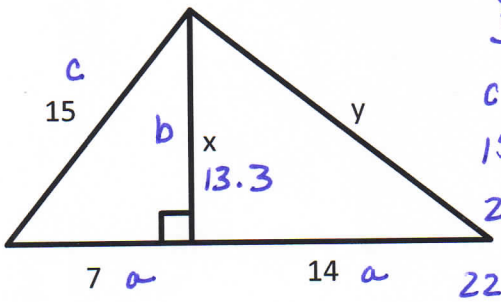
$169 = 25 + b^2$

$169 - 25 = b^2$

$\sqrt{144} = \sqrt{b^2}$

$12 = b$

c)



Find x

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

$15^2 = 7^2 + b^2$

$225 = 49 + b^2$

$225 - 49 = b^2$

$176 = b^2$

$13.3 = b$

Find y

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

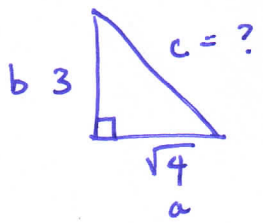
$y^2 = 14^2 + (13.3)^2$

$y^2 = 196 + 176.89$

$y^2 = 372.89$

$y = 19.3$

d) a = 3, b = √4, c = ?



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

$c^2 = (\sqrt{4})^2 + 3^2$

$c^2 = 4 + 9$

$c^2 = 13$

$c = 3.6$