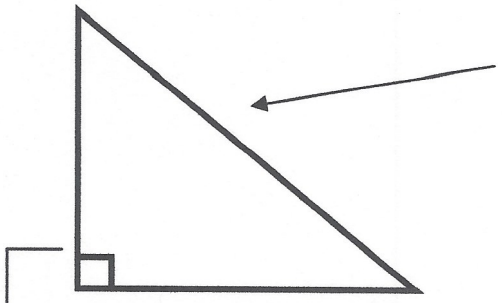
# Section 1.5 – Pythagorean Theorem

**Recall:**

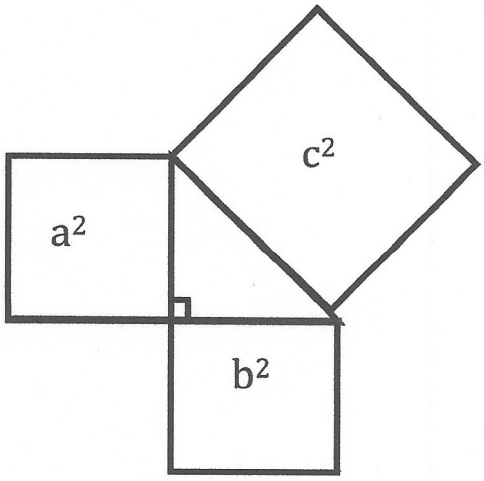
A right triangle is a triangle with one 90° angle.



*The side directly across from the 90° angle is called the* HYPOTENUSE.
*This is always the longest* side in a right triangle.

*The two remaining sides are called* LEGS.

Pythagoras found that if a triangle is a right triangle, the sum of the squares on the legs is equivalent to the square on the hypotenuse.

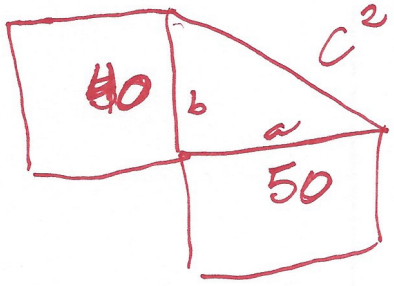



$$a^2 + b^2 = c^2$$

**Example 1:** Find the missing area:

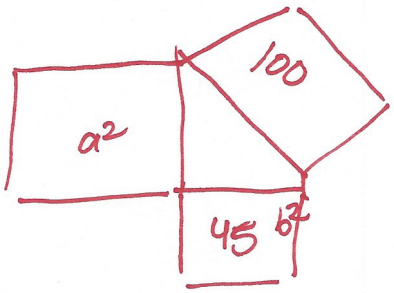
Notice here it's asking for $c^2$

a) $a^2 = 50$ and $b^2 = 40$, what is $c^2$?




$c^2 = 40 + 50 = 90$

b) $c^2 = 100$ and $b^2 = 45$, what is $a^2$?



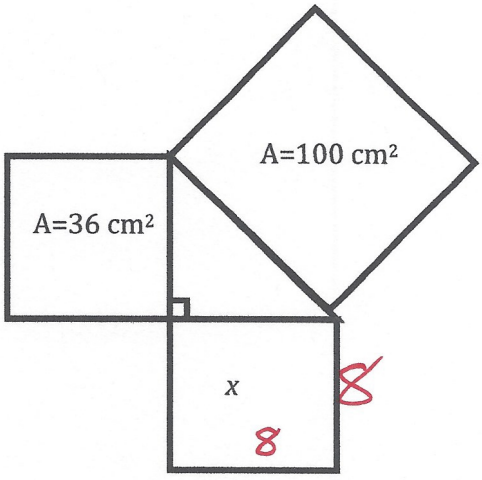

Since $a^2+b^2=c^2$

$45 + b^2 = 100$

then $b^2 = 55$

**Example 2:** Find the missing side length **(Remember, side length =$\sqrt{\text{Area}}$)**

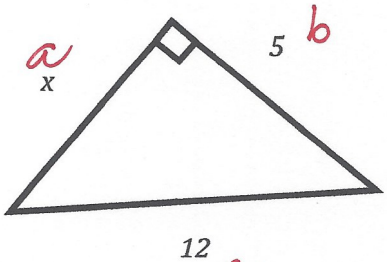
a)




$x = 100\,cm^2 - 36\,cm^2 = 64\,cm^2$

Since Area = $\sqrt{64}$ then side length is 8

b)




$12^2 = 5^2 + b^2$

$144 = 25 + b^2$

$b^2$ is 119

then $b = \sqrt{119} \approx 10.9$

**Textbook:** Page 34-35, #'s 3, 4, 5, 6, 9, 13