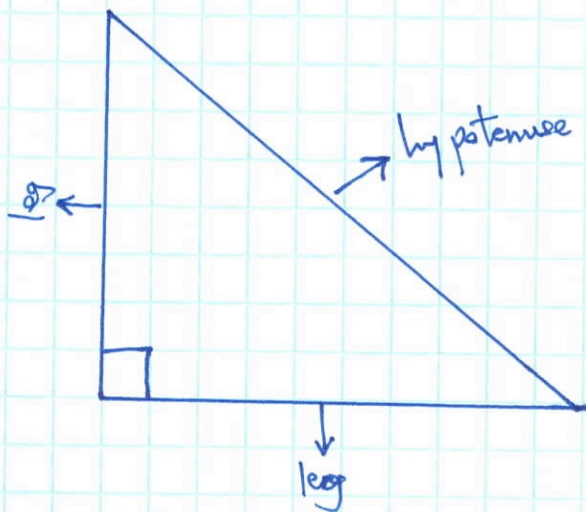
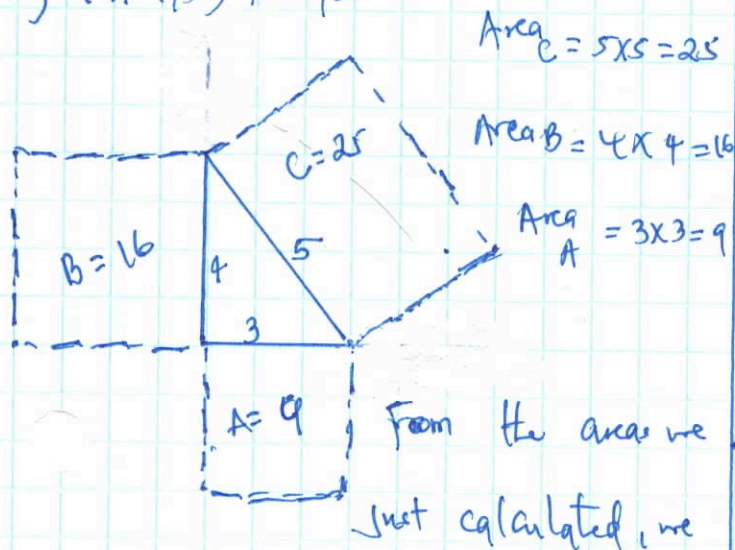


Pythagorean Theorem

- This theorem discusses the relationship among the side lengths of a right triangle; As given below.



To establish the relationship (Pythagorean theorem) to find the length of any side of a right triangle we draw the areas on the triangle e.g. (3, 4, 5) triangle



From the areas we just calculated, we

see that

$$Area_c = Area_A + Area_B$$

$$\therefore c^2 = a^2 + b^2 \rightarrow \text{Pythagorean theorem}$$

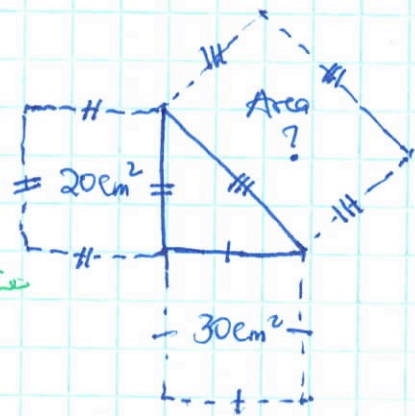
Now, let's use the relationship to find the length of any side of a right triangle

Example:

1. Find the area of

Q) sol.

Let x^2 represents the missing area.



and using theorem $c^2 = a^2 + b^2$

$$a^2 = 20cm^2 \quad x^2 = 20cm^2 + 30cm^2$$

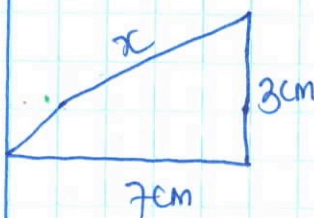
$$b^2 = 30cm^2$$

$$x^2 = c^2 \quad x^2 = 50cm^2$$

\therefore Therefore $Area_x = 50cm^2 \rightarrow$ simple!!

2. Find the length of each side labeled with a variable. Give your answers to one decimal place where needed.

Q)



sol.
using the identity

$$c^2 = a^2 + b^2, \quad c = x$$

$$\therefore b = 3cm$$

$$a = 7cm$$

$$x^2 = 3^2 + 7^2 = 9 + 49 = 58$$

$$\sqrt{x^2} = \sqrt{58}, \quad x = \sqrt{58} = 7.616$$

