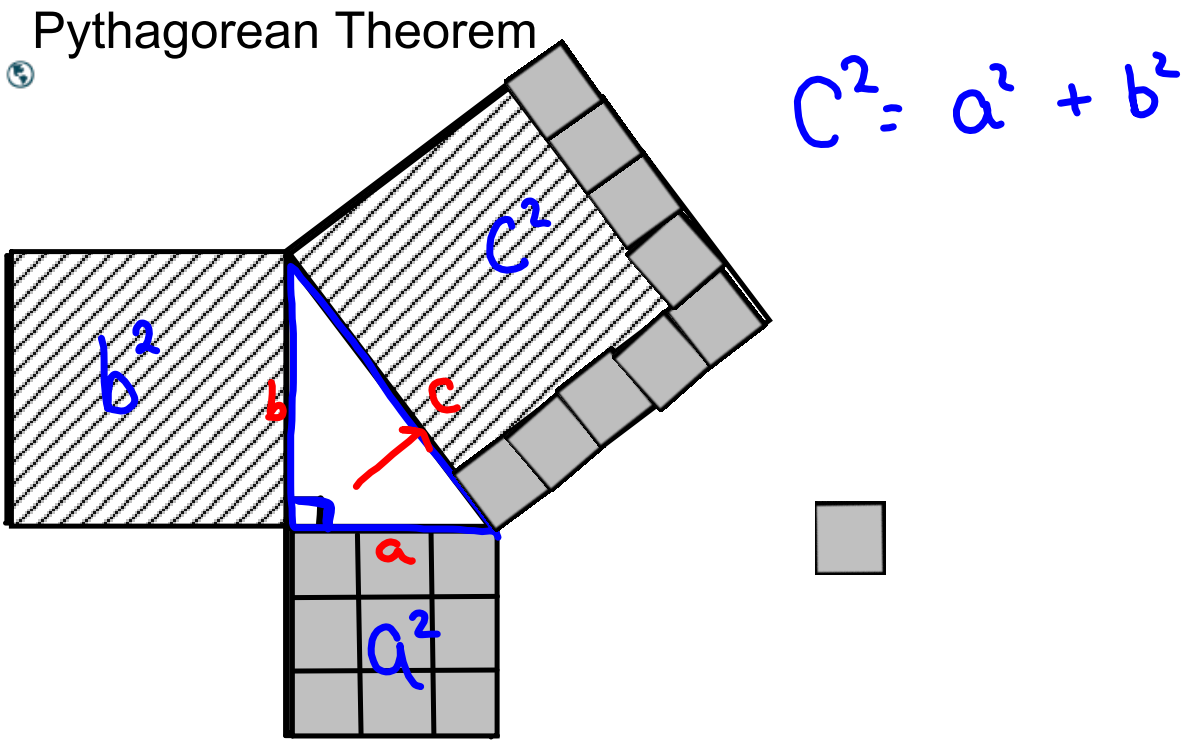

Pythagorean Theorem
$c^2 = a^2 + b^2$
b^2
c^2
b
c
a
a^2

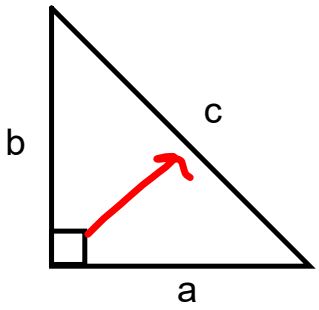
Pythagorean Theorem

- Right Angle Triangle has one angle that 90°

- the side directly across to the right angle is always the longest side, it is the **hypotenuse.**

We use "c" for the hypotenuse

- Legs are side "a" and "b"



Pythagorean Theorem Equation:

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

area of the square off the hypotenuse

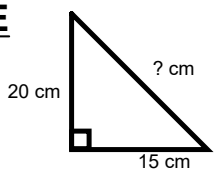
$$(c)^2 - (b)^2 = (a)^2$$

area of the square off the leg

Pythagorean Theorem Equation:

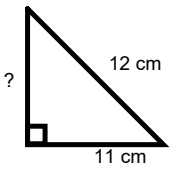
Then to find the length of the **HYPOTENUSE**

$$c = \sqrt{(a)^2 + (b)^2}$$



Then to find the length of a **LEG**

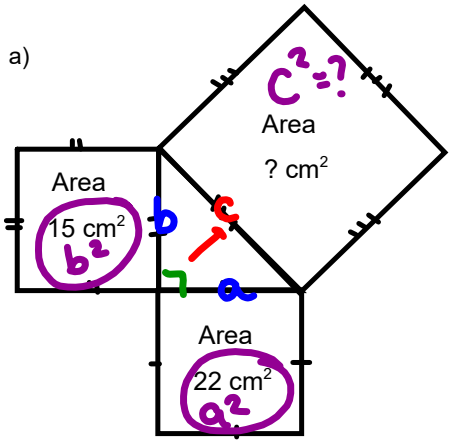
$$a = \sqrt{(c)^2 - (b)^2}$$



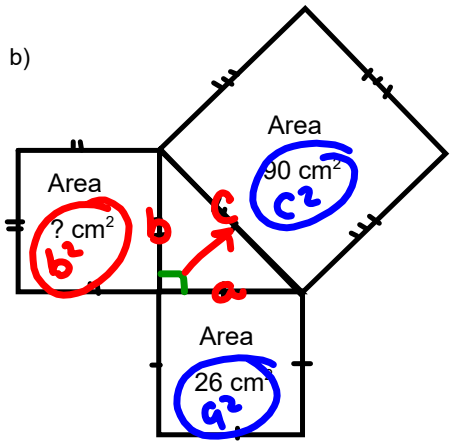
Example)

Find the area of the indicated square:

a)



b)



$c^2 = a^2 + b^2$ (squares)

$c^2 = 22\,cm^2 + 15\,cm^2$

$c^2 = 37\,cm^2$

$b^2 = c^2 - a^2$

$b^2 = 90\,cm^2 - 26\,cm^2$

$b^2 = 64\,cm^2$

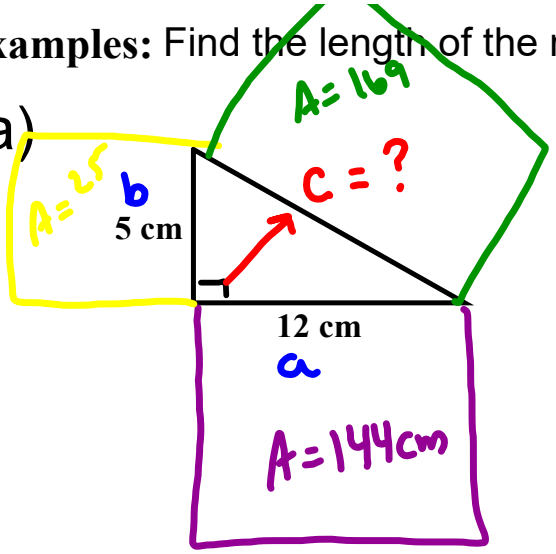
$c^2 = a^2 + b^2$

$a^2 = c^2 - b^2$

$b^2 = c^2 - a^2$

Examples: Find the length of the missing side.

2a)



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

$c^2 = (12cm)^2 + (5cm)^2$

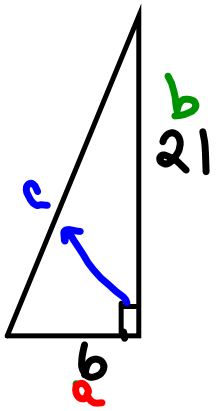
$c^2 = 144cm^2 + 25cm^2$

$c^2 = 169cm^2$

$\sqrt{c^2} = \sqrt{169\ cm^2}$

$c = 13cm$

2b)



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

$c^2 = (6)^2 + (21)^2$

$c^2 = 36 + 441$

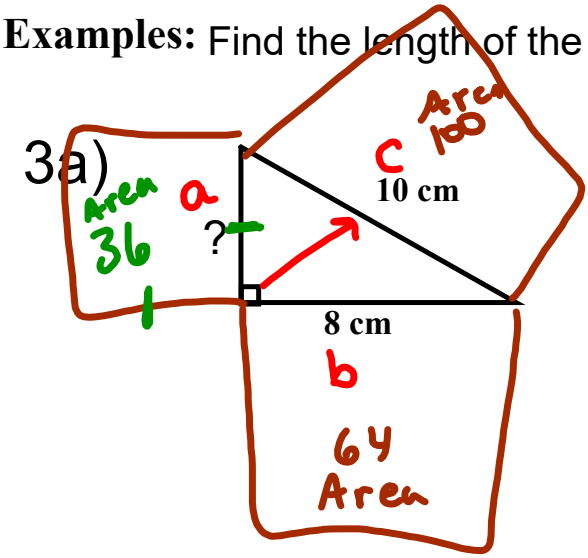
$c^2 = 477$

$\sqrt{c^2} = \sqrt{477}$

$c = 21.8$

Examples: Find the length of the missing side.

3a)



$a^2 = c^2 - b^2$

$a^2 = (10cm)^2 - (8cm)^2$

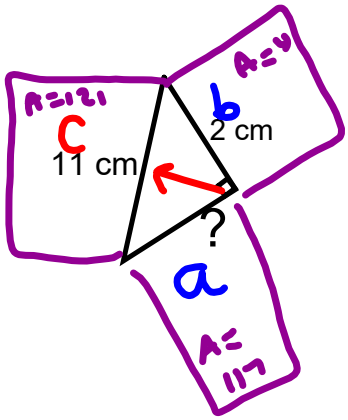
$a^2 = 100cm^2 - 64cm^2$

$a^2 = 36cm^2$

$\sqrt{a^2} = \sqrt{36cm}$

$a = 6cm$

3b)



$a^2 = c^2 - b^2$

$a^2 = (11cm)^2 - (2cm)^2$

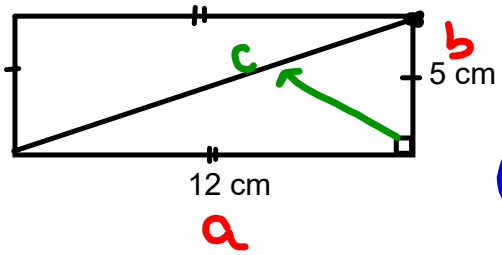
$a^2 = 121cm^2 - 4cm^2$

$a^2 = 117cm^2$

$\sqrt{a^2} = \sqrt{117}\,cm^2$

$a \approx 10.8cm$

Find the length of the diagonal of the rectangle.



ADD TO YOUR NOTES

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

$c^2 = (12\text{cm})^2 + (5\text{cm})^2$

$c^2 = 144\text{cm}^2 + 25\text{cm}^2$

$c^2 = 169\text{cm}^2$

$\sqrt{c^2} = \sqrt{169\text{cm}^2}$

$c = 13\text{cm}$