What's Going On?

Checking In

Minds on Areas of Squares

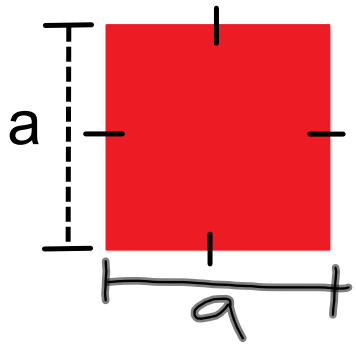
Action! The Formulae

Consolidation Stealing Second

Learning Goal - I will explore, understand and apply the Pythagorean Theorem.

Minds on

What's the area of the red square?

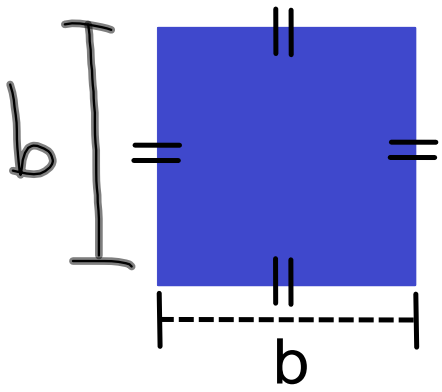


$$\text{Area} = (a)(a)$$
$$= a^2$$

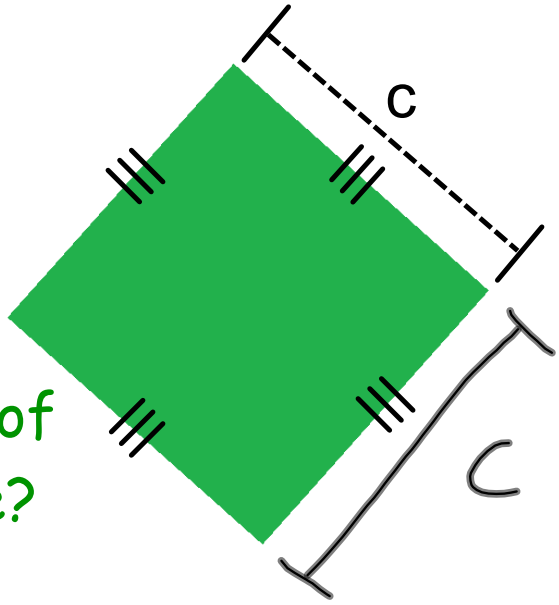
Minds on

What's the area of the blue square?

$$\text{Area} = (b)(b)$$
$$= b^2$$

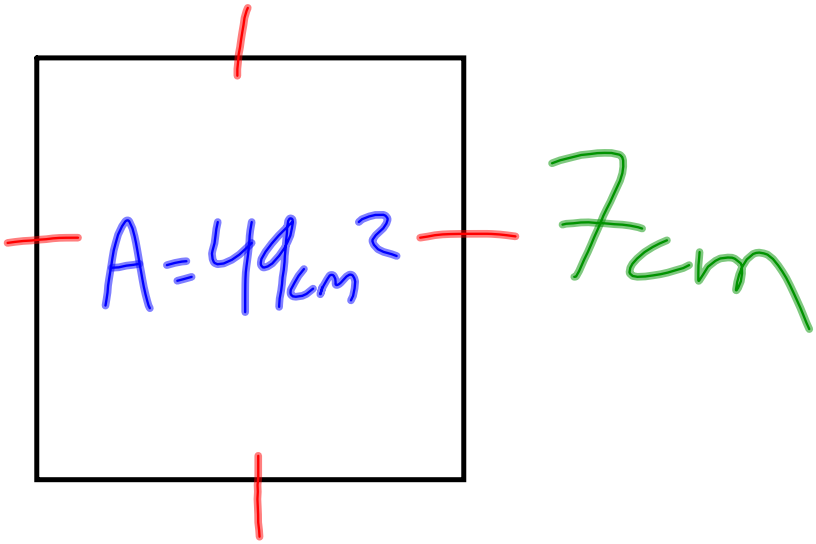


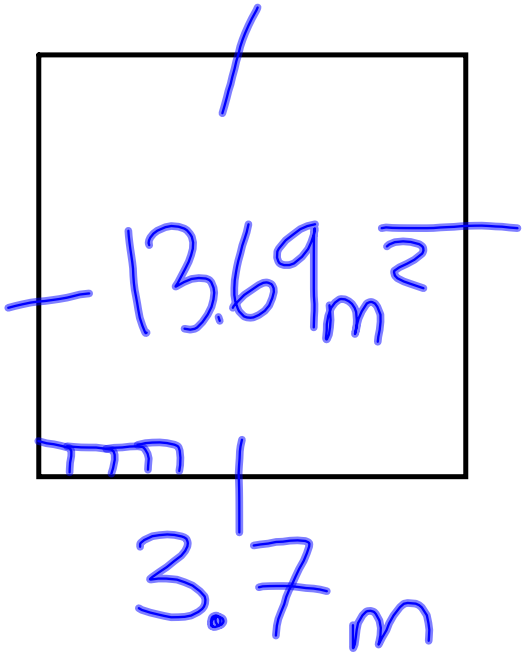
Minds on

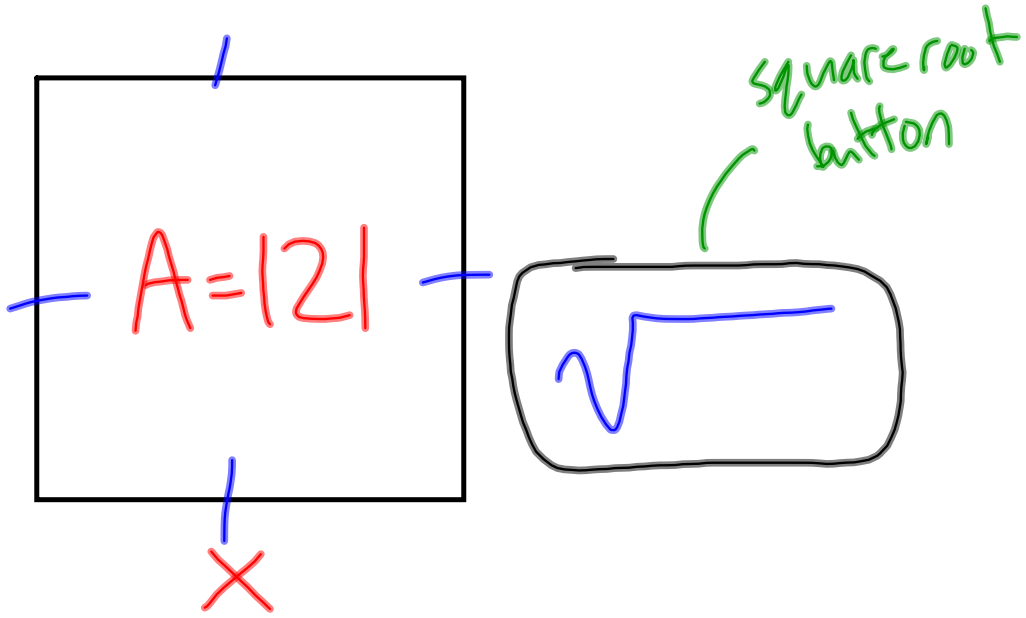


What's the area of the green square?

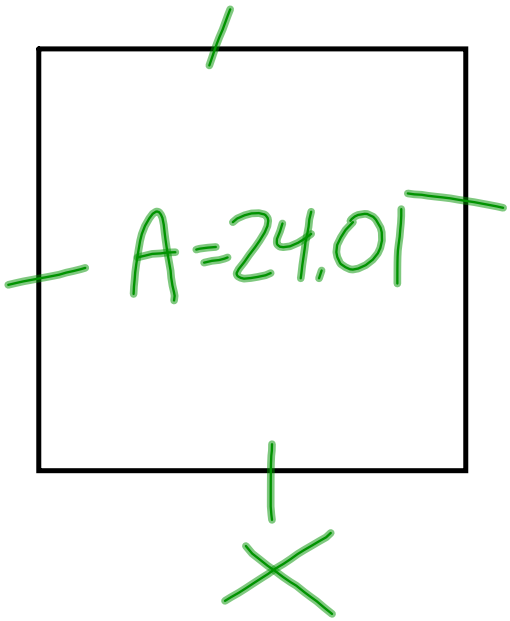
$$\text{Area} = (c)(c)$$
$$= c^2$$


A=49cm²
7cm


13.69 m²
3.7 m



X = 11

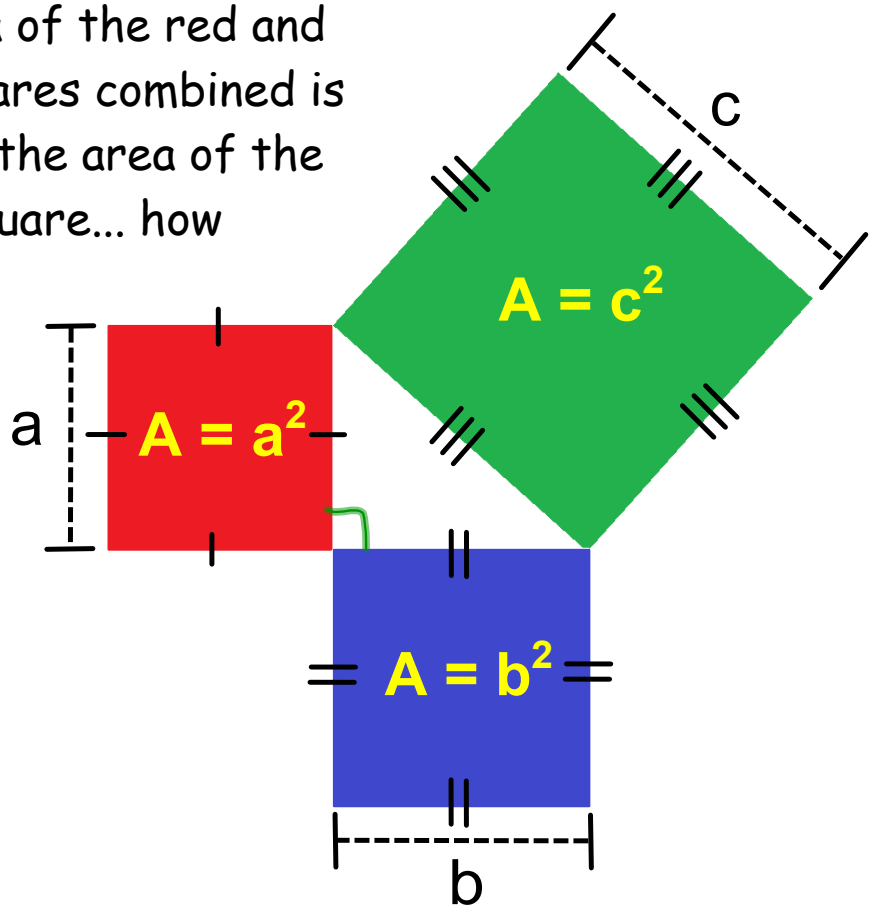

A=24.01
X

$$\sqrt{y^2} = \sqrt{44.89}$$

$$y = 6.7$$

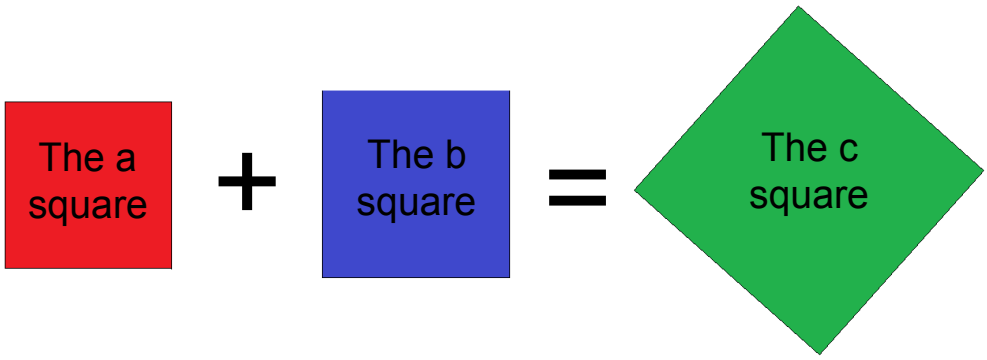
Minds on

The area of the red and blue squares combined is equal to the area of the green square... how curious!



Action!

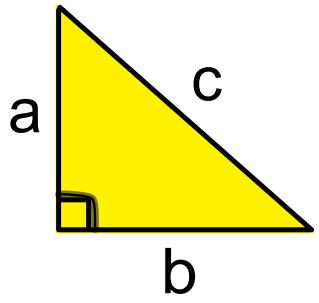
Formulating the Formula



What about that triangle in the middle?!

Action!

This formula, known as
The Pythagorean Theorem
applies to **all** right-triangles



c is
always
the hypotenuse!!!

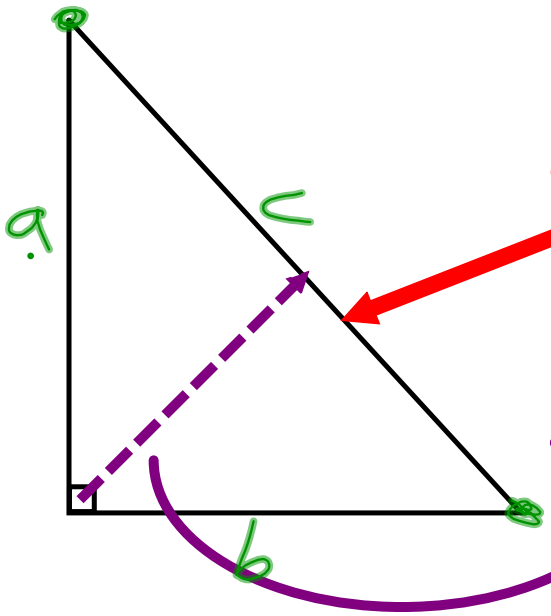
$$a^2 + b^2 = c^2$$

Action!

A Few Things About the Hypotenuse

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

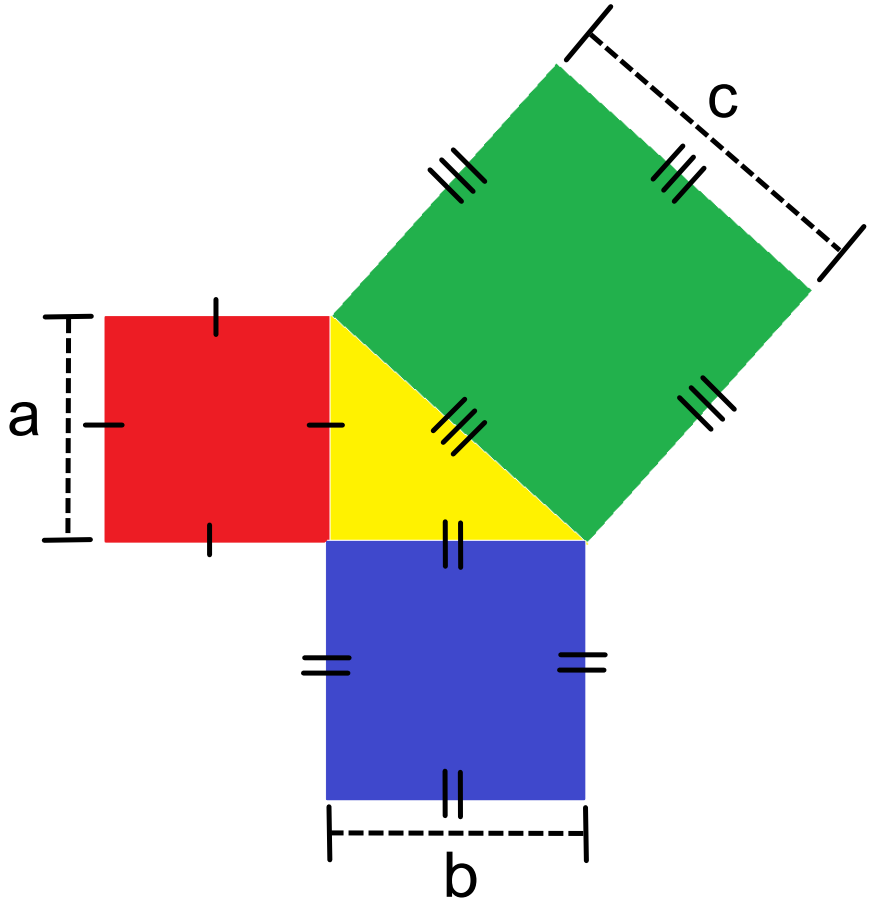
As I mentioned, the hypotenuse is ALWAYS the 'c' in the Pythagorean Theorem.

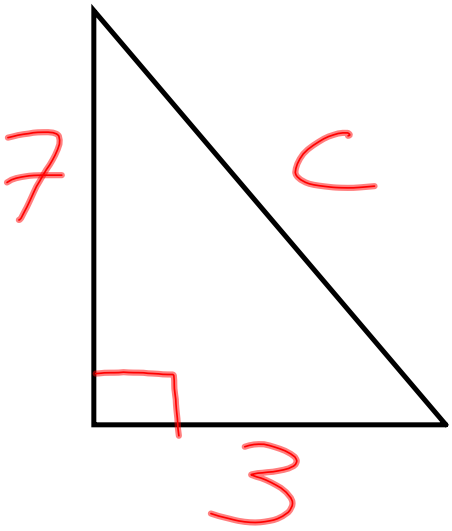


The hypotenuse is also, ALWAYS, the longest side in a right triangle.

The hypotenuse is also always the side "opposite" the right angle!

Action!





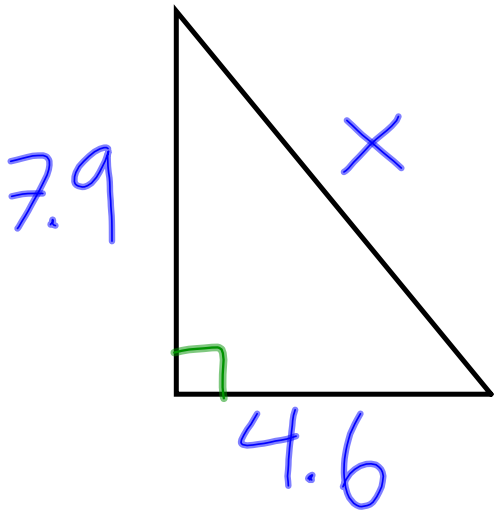
$a^2+b^2=c^2$

$3^2+7^2=c^2$

$9+49=c^2$

$\sqrt{58}=\sqrt{c^2}$

$7.6=c$



$7.9^2 + 4.6^2 = x^2$

$62.41 + 21.16 = x^2$

$\sqrt{83.57} = \sqrt{x^2}$

$9.1 = x$

Action!

Rearranging the Formula for a^2

$$a^2 + b^2 = c^2$$
$$- b^2 \qquad - b^2$$

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

hypotenuse

subtraction

Action!

Rearranging the Formula for a^2

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

$$-a^2 \qquad -a^2$$

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

Action!

The Pythagorean Theorems

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

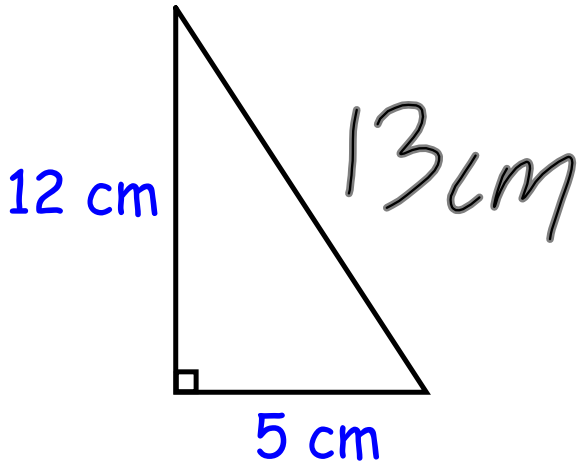
$$a^2 = c^2 - b^2$$

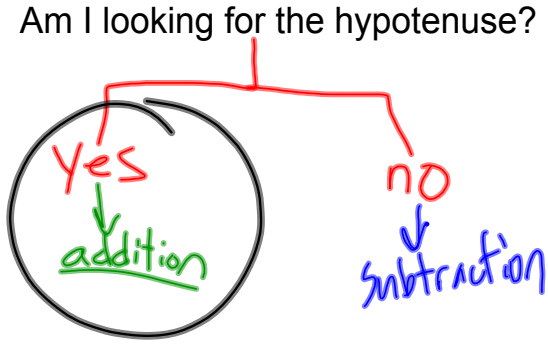
$$b^2 = c^2 - a^2$$

Action!

Try a Few

Find the Length of the Missing Side





Action!

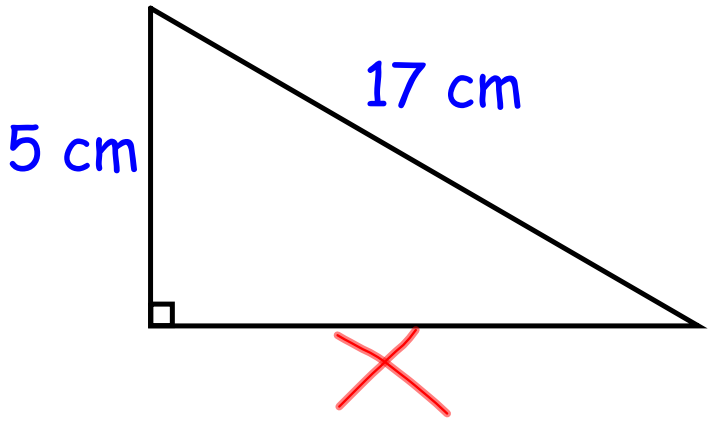
Try a Few

Find the Length of the Missing Side

Am I looking for the hypotenuse?

yes → addition

no → subtraction



$$x^2 = 17^2 - 5^2$$

$$x^2 = 289 - 25$$

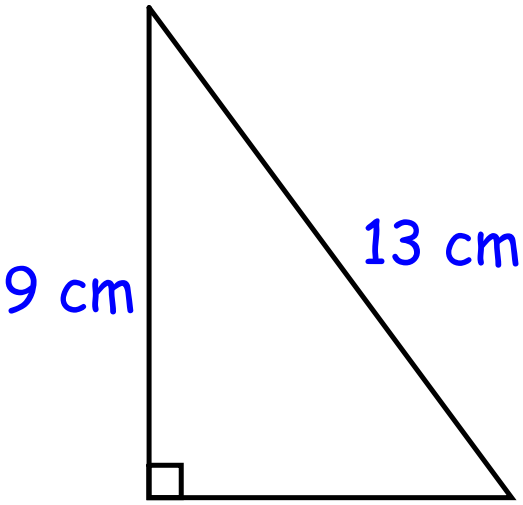
$$x^2 = 264$$

$$x \approx 16.2$$

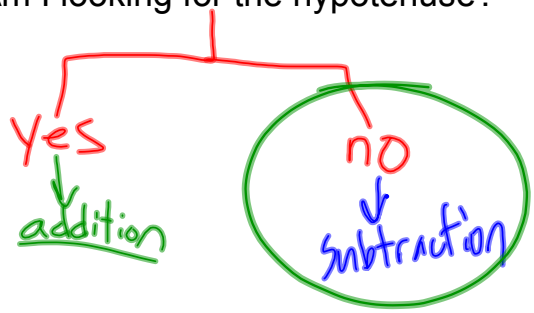
Action!

Try a Few

Find the Length of the Missing Side



Am I looking for the hypotenuse?



$x^2 = 13^2 - 9^2$

$x^2 = 169 - 81$

$\sqrt{x^2} = \sqrt{88}$

$x \approx 9.4$

Consolidation

Think, Pair, Share

A baseball "diamond" is actually a square!
Each base path measures 27 m.
If a player is at first, trying to steal second, how far does the catcher have to throw the ball to get the runner out at second?

Consolidation

Practice

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1,2 (a, c), 3b, 7-9