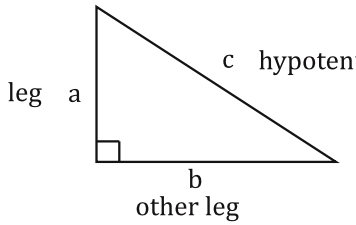
Pythagorean Theorem

P....P.....what?

Well, it doesn't have the best name in the world. This idea is actually named after a Greek guy named Pythagoras. Allegedly he came up with it, but most people think he actually stole it from the Egyptians. We let him get away with it because the Egyptians already have enough fame and glory without it. Why is it so important? Well, the Egyptians likely used it to build the pyramids. Think of it, a single math idea that created arguably the most recognized structures ever made. Not bad for a little math, eh?

Okay, okay, this isn't a history book. Let's get on with it. The Pythagorean theorem is a formula that relates the sides of a right triangle to each other. The sum of the squares of the two legs of the right triangle is equal to the square of the hypotenuse.



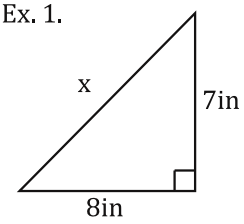
Pythagorean theorem

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

It is critically important that the hypotenuse be the "c". The two legs you can switch because addition is commutative. (Huh? Get out your algebra book) If you don't make the "c" the hypotenuse King Tut will rise from his sarcophagus and eat your brain. Trust me, I know from experience. Here are a couple of examples of how to use it.

Use the Pythagorean theorem to find the missing side of each triangle.

Ex. 1.



Step 1: Write out the theorem.

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

Step 2: Plug in and solve.

$8^2+7^2=x^2$ (Notice the "x". The hypotenuse is where the "c" was. Don't lose your brains!)

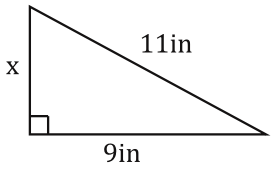
$64+49=x^2$

$113=x^2$

$\sqrt{113}=\sqrt{x^2}$

$10.6in=x$ (Well, it's actually 10.63014581in, but we will round to the nearest tenth.)

Ex. 2.



Step 1: Write out the theorem.

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

Step 2: Plug in and solve.

$x^2+9^2=11^2$ (Notice the "x" is one of the legs this time, and "11" is the hypotenuse. Don't mix these up!)

$x^2+81=121$

$-81 \quad -81$

$x^2=40$

$\sqrt{x^2}=\sqrt{40}$

$x=6.3in$

To the chariots! (That's Egyptian for "let's go.")