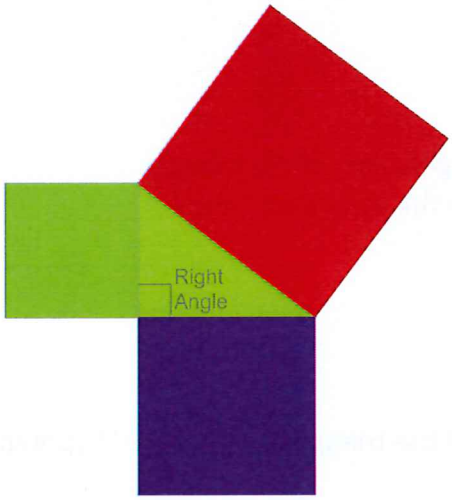
PYTHAGORAS' THEOREM

Over 2000 years ago there was an amazing discovery about triangles:

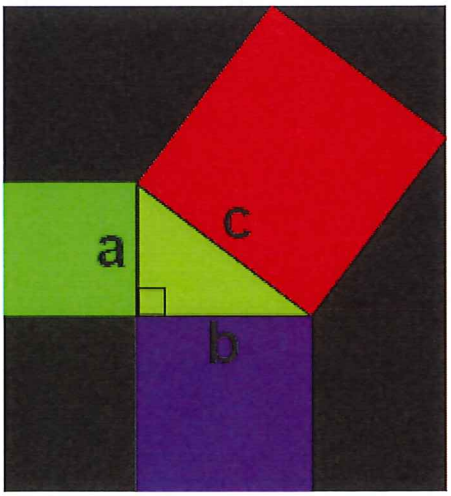
When a triangle has a right angle (90°) ...

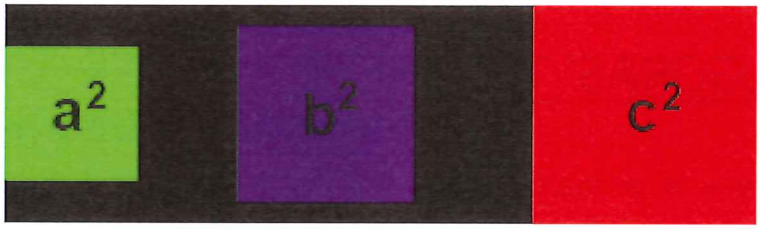
... and squares are made on each of the three sides, ...

Go



*... then the biggest square has the **exact same area** as the other two squares put together!*





It is called "Pythagoras' Theorem" and can be written in one short equation:

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

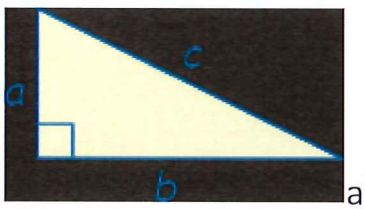
Note:

- **c** is the **longest side** of the triangle
- **a** and **b** are the other two sides

Definition

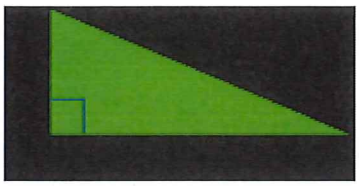
The longest side of the triangle is called the "hypotenuse", so the formal definition is:

In a right angled triangle:
the square of the hypotenuse is equal to
the sum of the squares of the other two sides.



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

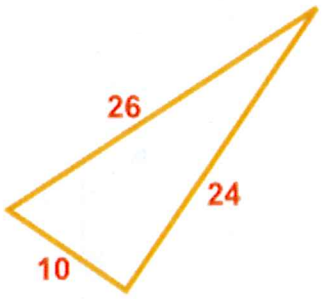
Example: Solve this triangle



Start with: $a^2 + b^2 = c^2$
Put in what we know: $5^2 + 12^2 = c^2$
Calculate squares: $25 + 144 = c^2$
25+144=169: $169 = c^2$
Swap sides: $c^2 = 169$
Square root of both sides: $c = \sqrt{169}$
Calculate: **$c = 13$**

when the three sides of a triangle make $a^2 + b^2 = c^2$, then the triangle is right angled.

Example: Does this triangle have a Right Angle?



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

- $a^2 + b^2 = 10^2 + 24^2 = 100 + 576 =$ **676**
- $c^2 = 26^2 =$ **676**

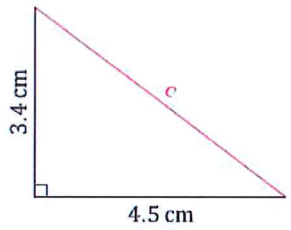
They are equal, so ...

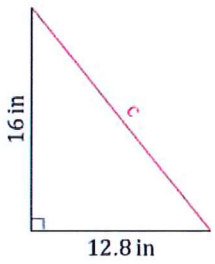
Yes, it does have a Right Angle!

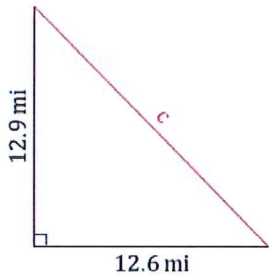
Pythagorean Theorem (A)

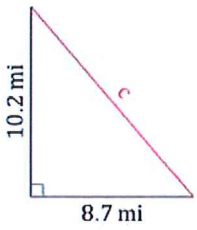
Name: _____ Date: _____

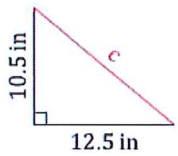
Calculate the missing side measurement using $a^2 + b^2 = c^2$.

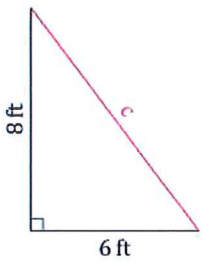
1. 

2. 

3. 

4. 

5. 

6. 

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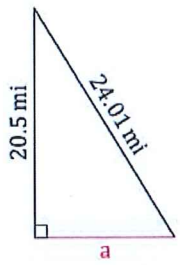
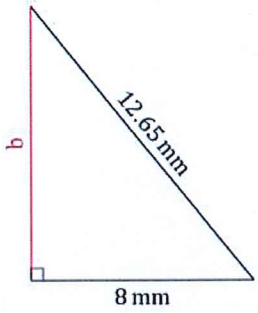
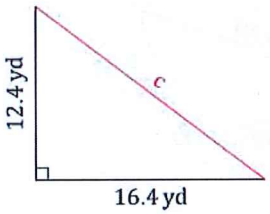
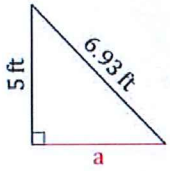
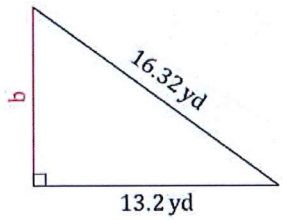
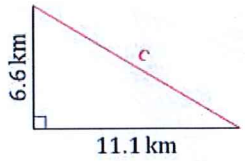
1. 

2. 

3. 

4. 

5. 

6. 

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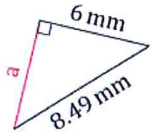
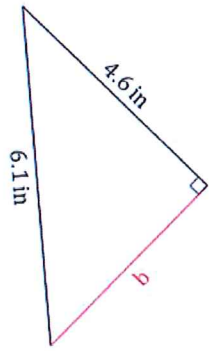
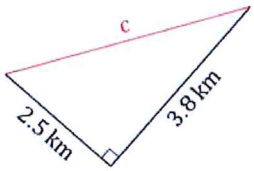
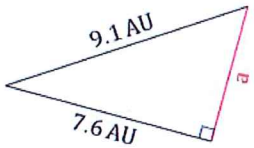
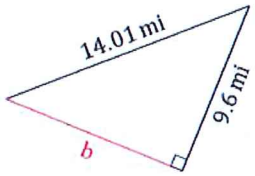
1. 

2. 

3. 

4. 

5. 

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