

Mrs. Peden

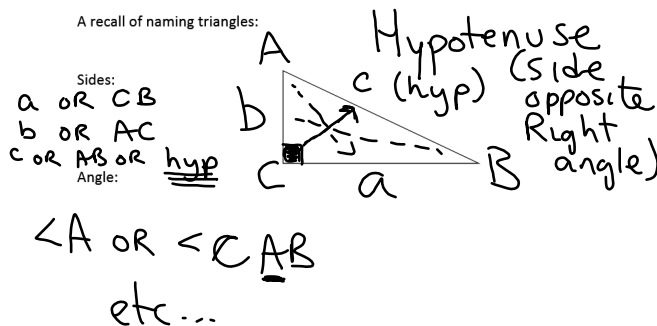
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**Pythagorean Relationship Summary**

**Who was Pythagoras?**

He was a Greek philosopher who lived from about 569 BC to 475 BC and has played key roles in developments of mathematics, astronomy and the theory of music. However, he is best known for proving that the Pythagorean Theorem was true!

A recall of naming triangles:



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**What we learned yesterday:**

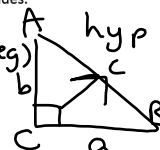
**Pythagorean Relationship in Words:**

For any Right angle triangle, the square of the hypotenuse is equal to the sum (addition) of the squares of the other two sides.

**Pythagorean Relationship in Algebra**

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

(leg)  
side<sup>2</sup> + side<sup>2</sup> = hyp<sup>2</sup>



NOTE:  
Sides a and b are always the smaller values (legs)

The Hypotenuse will ALWAYS be the LARGEST distance or the largest squared value!

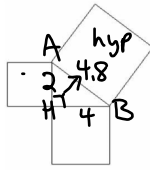
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Using the Theorem to determine the squared area of a side

For example 1: A square has been drawn on each side of a right angle triangle AHB.  
Find the area of the square on side AH



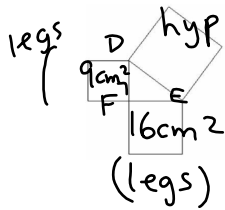
$$\begin{aligned}
 A &= b^2 \\
 A_{\text{sq}} &= b \times b \\
 &= 2 \times 2 \\
 &= 4 \text{ cm}^2
 \end{aligned}$$

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For example 2: A square has been drawn on each side of a right angle triangle DEF.  
Find the area of the square on side DE



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 9 + 16 &= c^2 \\
 25 &= DE
 \end{aligned}$$

$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 a^2 + 17 &= 22 - 17 \\
 \sqrt{a^2} &= \sqrt{5} \\
 a &= 2.23
 \end{aligned}$$

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Example 3: For the following sets of three squares does Pythagorean hold true? If so, identify what the length of the hypotenuse is.

a) 4 cm<sup>2</sup>, 12 cm<sup>2</sup>, 19 cm<sup>2</sup>

NO

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

$$4 + 12 \neq 19 \quad X$$

b) 24 cm<sup>2</sup>, 5 cm<sup>2</sup>, 19 cm<sup>2</sup>

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

$$5 + 19 = 24 \quad \checkmark$$

\*\*\*for each triangle, please identify the hypotenuse side\*\*\*

Work: p.53 # 4-9 a,b, 10-11, 13, 2-3