

Name: Key  
Date: \_\_\_\_\_

Mr. Johnson  
Math 8

**Lesson 1.6 – Exploring the Pythagorean Theorem**

Think it out....

Suppose you were given a triangle that looked to be a right triangle, how could you be sure that it actually is?

ideas that may come up with  
- Pythagorean theorem  
- Protractor  
- etc.

Example:

1. Use the Pythagorean Theorem to determine if a triangle with the side lengths given form a right triangle

a. 7 cm. , 7 cm. , 9 cm.

must be hypotenuse since it is the largest

$$a^2 + b^2 = c^2$$
$$(7)^2 + (7)^2 = (9)^2$$
$$49 + 49 = 81$$
$$98 \neq 81 \quad \therefore \text{does not form a right } \triangle$$

b. 7 cm. , 24. cm, 25 cm.

$$a^2 + b^2 = c^2 \quad \uparrow \text{hypotenuse}$$
$$(7)^2 + (24)^2 = 25^2$$
$$49 + 576 = 625$$
$$625 = 625 \quad \checkmark \quad \therefore \text{does form a right } \triangle$$

What were your findings?

Example 'b' formed a right  $\triangle$  and example 'a' did not because of the Pythagorean theorem

Notes:

The Pythagorean Theorem is only true for right triangles.

Therefore if:

$a^2 + b^2 = c^2$ , then the triangle is a right triangle

And, if:

$a^2 + b^2 \neq c^2$ , then the triangle is not a right triangle  
↓  
does not equal

A set of 3 whole numbers that satisfies the Pythagorean Theorem is called a Pythagorean triple.

For example:

3, 4, 5

6, 8, 10

etc.

Example:

2. Is 12, 16, 20 a Pythagorean triple? Show why or why not.

$a^2 + b^2 = c^2$   
 $12^2 + 16^2 = 20^2$   
 $144 + 256 = 400$   
 $400 = 400$

↓ hypotenuse  
∴ a right triangle which indicates 12, 16, 20 is a Pythagorean triple.

Assignment:

Pg. 42-45

#'s 1-12, 14