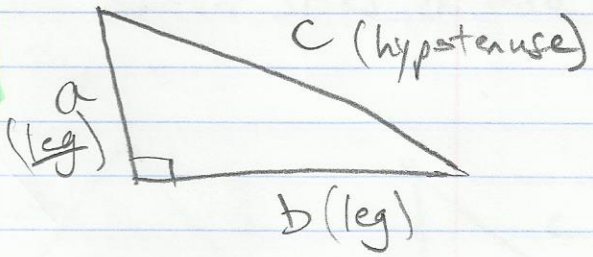
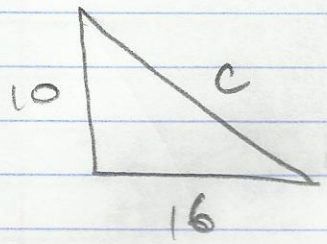
Pythagorean Theorem

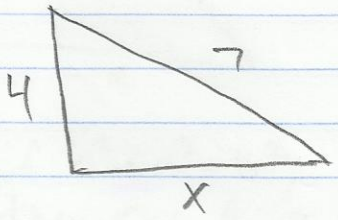
$$a^2 + b^2 = c^2$$



Ex)



$10^2 + 16^2 = c^2$
$100 + 256 = c^2$
$356 = c^2$
$c = \sqrt{356}$
$c = \sqrt{4 \cdot 89}$
$\boxed{c = 2\sqrt{89}}$



$4^2 + x^2 = 7^2$
$16 + x^2 = 49$
$x^2 = 33$
$\boxed{x = \sqrt{33}}$

Pythagorean Triple: a set of non-zero whole numbers that satisfies the equation $a^2 + b^2 = c^2$.

Ex) 3, 4, 5

$3^2 + 4^2 = 5^2$
$9 + 16 = 25$
$25 = 25$

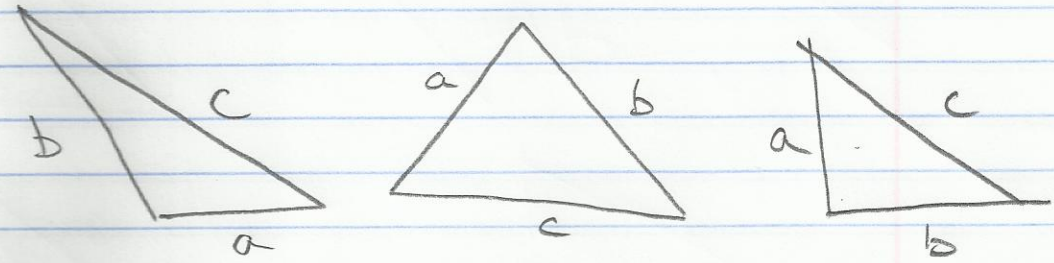
Other P.T.s...

5, 12, 13 → 10, 24, 26
8, 15, 17 → 24, 45, 51
7, 24, 25 → 14, 48, 50

* multiples of P.T.s are also P.T.s

Acute, Right, or Obtuse?

For any triangle, with shorter sides a and b, and longest side c, . . .



If $c^2 > a^2 + b^2$, then the $\triangle$ is obtuse

If $c^2 < a^2 + b^2$, then the $\triangle$ is acute.

If $c^2 = a^2 + b^2$, the $\triangle$ is right.

Are the $\triangle$s w/ the following side lengths acute, obtuse or right?

① 7, 8, 9

$9^2 \quad 8^2 + 7^2$

$81 \quad 64 + 49$

$81 < 113$

Acute

② 6, 8, 10

$10^2 \quad 6^2 + 8^2$

$100 \quad 36 + 64$

$100 = 100$

Right

③ 6, 11, 14

$14^2 \quad 11^2 + 6^2$

$196 \quad 121 + 36$

$196 > 157$

Obtuse