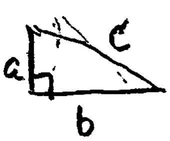
GEOMETRY 1 | TUESDAY 10-23-12 | CLASS NOTES

Pg 360

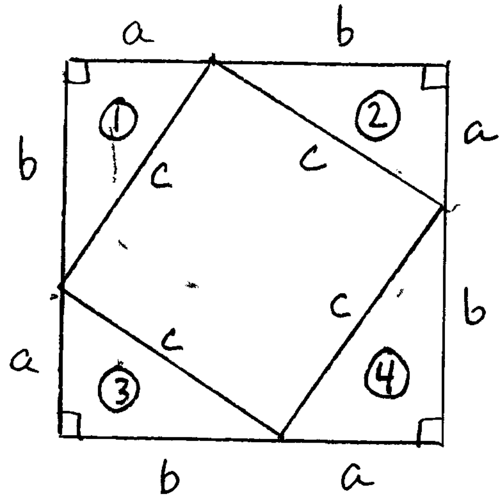
A Proof of THE Pythagorean Theorem

- WHICH President discovered AN original proof of THE PT?
  (it involved trapezoids)

GIVEN: 

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

Proof: make 4 copies of THE $\triangle$ AND arrange AS SHOWN



$\text{Area}_{\square} = (a+b)^2$ Big $\square$

$\text{Area}_{\square} = c^2$ small $\square$

$\text{Area}_{\triangle} = \frac{1}{2}ab$

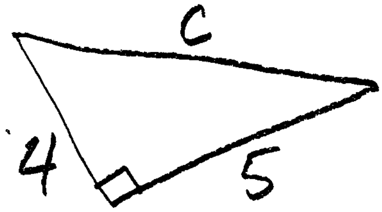
$4 \cdot \text{Area}_{\triangle} = \frac{4}{2}ab = 2ab$

$\underset{\text{BIG}}{\text{Area}\,\square} = \underset{\text{SMALL}}{\text{Area}\,\square} + \underset{\text{total}}{\text{Area}\,\triangle}$

$$a^2 + 2ab + b^2 = c^2 + 2ab$$
$$-2ab \qquad\qquad -2ab$$
$$\boxed{a^2 + b^2 = c^2} \text{ QED}$$

Homework Review

(6.)



$$c^2 = 4^2 + 5^2$$

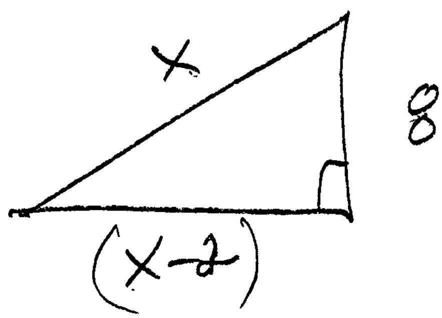
$$c^2 = 16 + 25$$

$$c^2 = 41$$

$$\boxed{c = \sqrt{41}}$$

NOT A Pythagorean Triple because $\sqrt{41}$ is NOT AN integer

(4)



$$x^2 = 8^2 + (x-2)^2$$

$$\cancel{x^2} = 64 + \cancel{x^2} - 4x + 4$$

$$\underset{+4x}{0} = 68 \underset{+4x}{-4x}$$

$$\frac{4x}{4} = \frac{68}{4}$$

$$\boxed{x = 17}$$

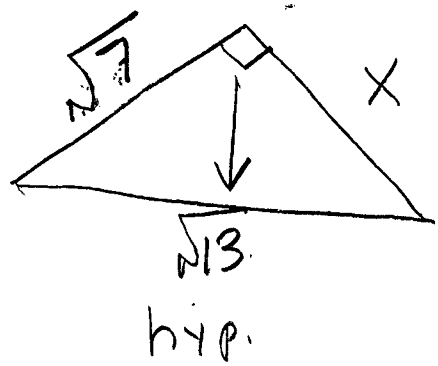
$\boxed{8, 15, 17}$

$\boxed{5, 12, 13}$

$\boxed{3, 4, 5}$

WORKSHEET PROBLEMS

(6)



$$(\sqrt{7})^2 + x^2 = (\sqrt{13})^2$$

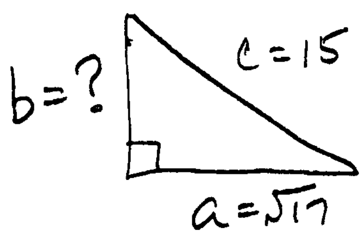
$$7 + x^2 = 13$$

$$x^2 = 6$$

$$\boxed{x = \sqrt{6}}$$

RT

(7.) $a = \sqrt{17}$ $c = 15$



$$(\sqrt{17})^2 + b^2 = 15^2$$

$$17 + b^2 = 225$$

$$-17 \qquad -17$$

$$b^2 = 208$$

$$b = \sqrt{208}$$

$$b = \sqrt{16}\sqrt{13}$$

$$\boxed{b = 4\sqrt{13}}$$