Warm up:

Simplify.

1) $4(3x - 5) = 12x - 20$

2) $3(2x + 7) = 6x + 21$

3) $-8(9x - 2) = -72x + 16$

4) $5(x + 6) = 5x + 30$

HW Solutions

(3) $(1, 2)$ $(-2, 11)$

$1-(-2) = 3$

$11-2 = 9$

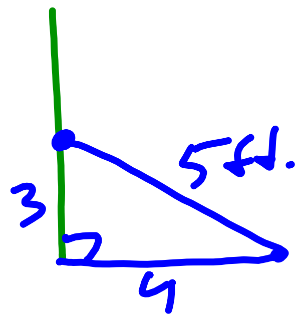
$3^2 + 9^2 = d^2$

$9 + 81$

$\sqrt{90} = \sqrt{d^2}$

$9.49 = d$

(16)



$3^2 + 4^2 = x^2$

$9 + 16$

$\sqrt{25} = \sqrt{x^2}$

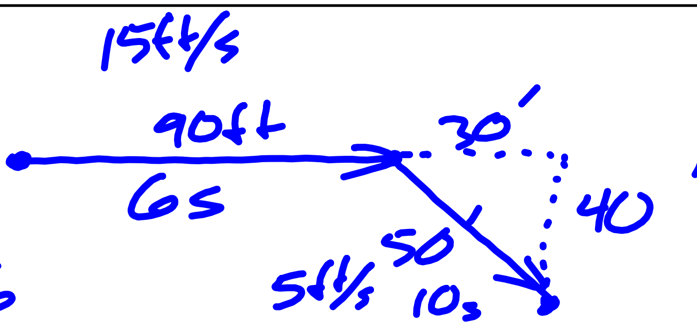
$5 = x$

$5 \cdot 3 = 15$ ft/tree

$\times 6$

90 ft

(9)



$d = rt$

$90 = 15t$

$50 = 5t$

$\frac{90}{15} = 6$

$\frac{50}{5} = 10$

$30^2 + 40^2 = x^2$

$900 + 1600$

$\sqrt{2500} = \sqrt{x^2}$

$50 = x$

16 s

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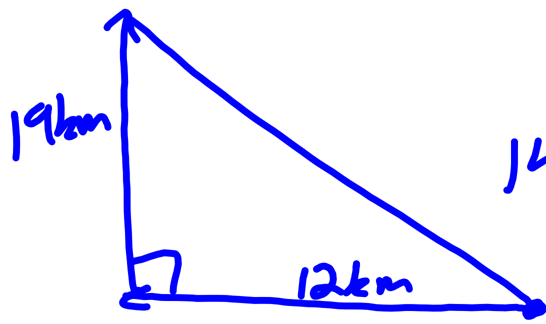
12



$$12^2 + 19^2 = x^2$$

$$144 + 361$$

$$\sqrt{505} = \sqrt{x^2}$$

22.47km

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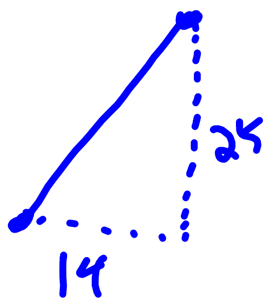
14



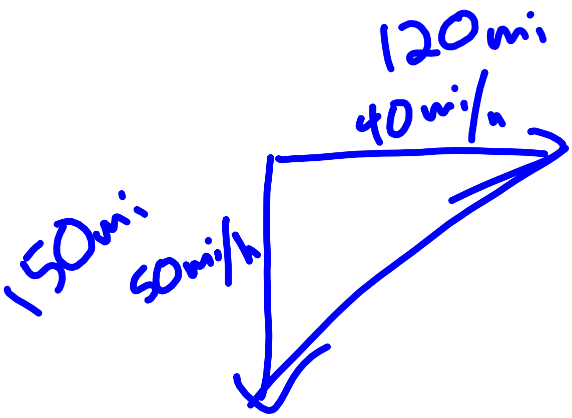
$14^2 + 25^2 = x^2$

$196 + 625$

$\sqrt{821} = \sqrt{x^2}$

28.65 yd

15



$150^2 + 120^2 = x^2$

$22500 + 14400 = x^2$

$\sqrt{36900} = \sqrt{x^2}$

192.09 mi

$$(x + 5)(3x + 4)$$

$$3x(x+5) + 4(x+5)$$

$$3x^2 + 15x + 4x + 20$$

$$3x^2 + 19x + 20$$

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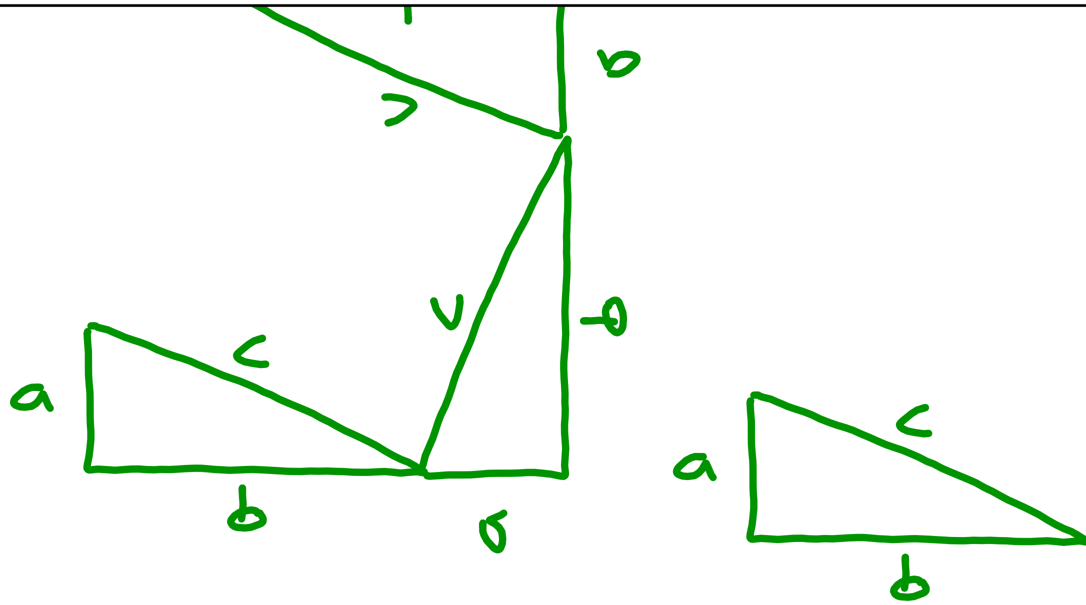
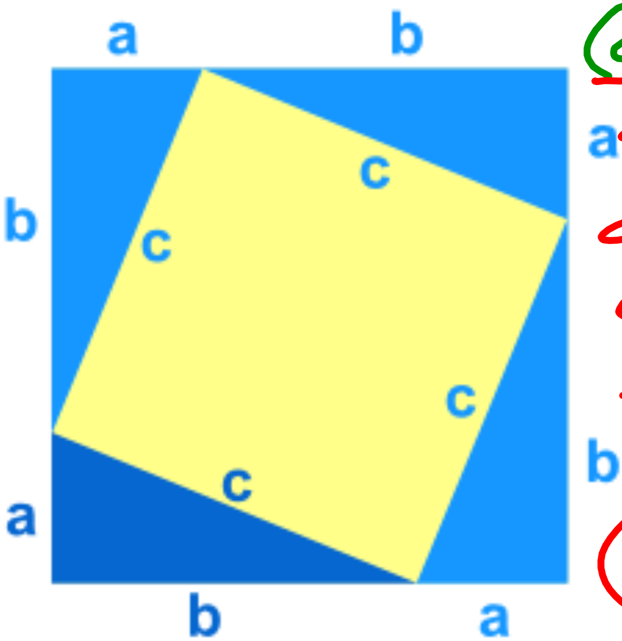


Proof of Pythagorean Theorem



$$(a+b)(a+b) = 4 \cdot \tfrac{1}{2}ab + c \cdot c$$

$$a(a+b) + b(a+b) = 2ab + c^2$$

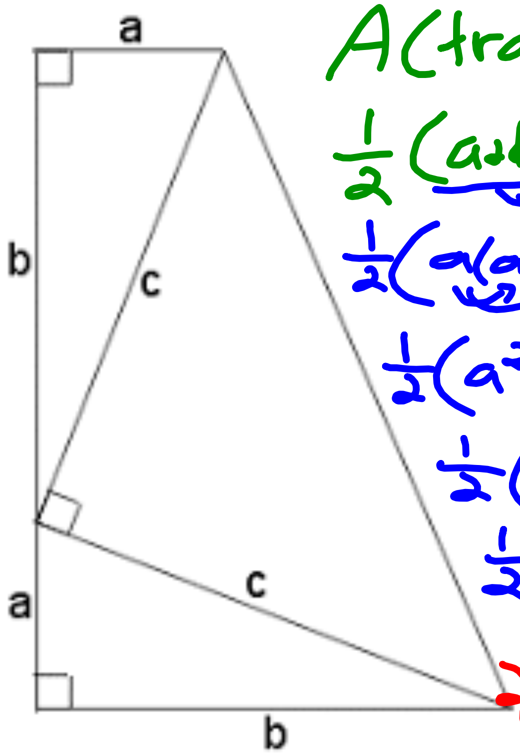
$$a^2 + ab + ab + b^2 = 2ab + c^2$$

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

$$\quad -2ab \qquad\qquad -2ab$$

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

James Garfield's Proof



$$A(\text{trapezoid}) = \frac{1}{2}h(b_1+b_2)$$

$$\frac{1}{2}(a+b)(a+b) = 2\cdot\frac{1}{2}ab + \frac{1}{2}\cdot c\cdot c$$

$$\frac{1}{2}\left(a(a+b) + b(a+b)\right) = ab + \frac{1}{2}c^2$$

$$\frac{1}{2}(a^2 + ab + ab + b^2) = ab + \frac{1}{2}c^2$$

$$\frac{1}{2}(a^2 + 2ab + b^2) = ab + \frac{1}{2}c^2$$

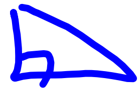
$$\frac{1}{2}a^2 + \cancel{ab} + \frac{1}{2}b^2 = \cancel{ab} + \frac{1}{2}c^2$$

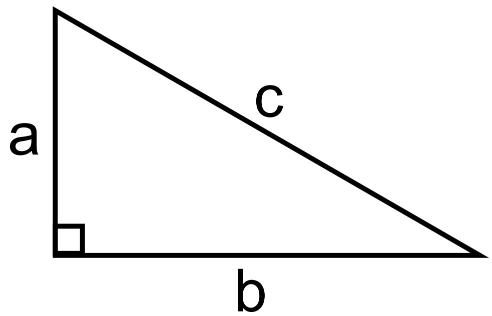
$$-ab \qquad\qquad -ab$$

$$2\left(\frac{1}{2}a^2 + \frac{1}{2}b^2\right) = \left(\frac{1}{2}c^2\right)2$$

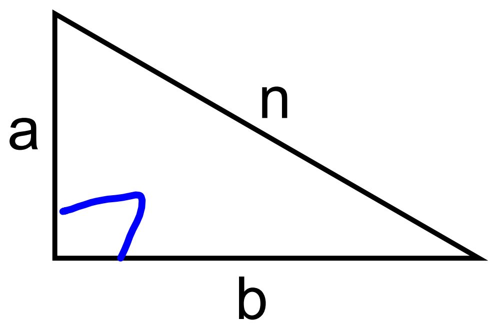
$$a^2 + b^2 = c^2$$

Proof of the Converse of the Pythagorean Theorem

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



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

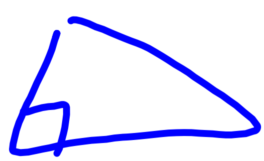


$a^2+b^2=n^2$

$n=c$ substitution

triangles are $\cong$ SSS

all $\angle$'s and sides are $\cong$



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