

Notes:

Applying The Pythagorean Theorem

Created for you by MS. Khotsavbanh

Example 1: Maddy's rectangular garden is represented in the diagram below. If a diagonal walkway crosses her garden, what is its length, in feet?

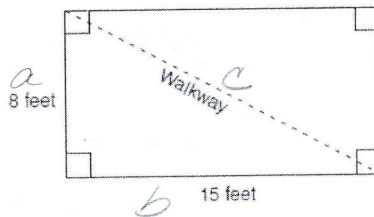
$$a^2 + b^2 = c^2$$

$$8^2 + 15^2 = c^2$$

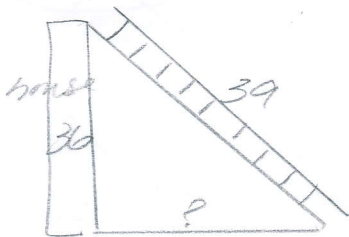
$$64 + 225 = c^2$$

$$\sqrt{289} = \sqrt{c^2}$$

$$17ft = c$$



Example 2: How many feet from the base of a house must a 39-foot ladder be placed so that the top of the ladder will reach a point on the house 36 feet from the ground? (draw a diagram)



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

$$36^2 + b^2 = 39^2$$

$$1296 + b^2 = 1521$$

$$\begin{array}{r} -1296 \\ \hline \end{array}$$

$$\sqrt{b^2} = \sqrt{225}$$

$$b = 15ft$$

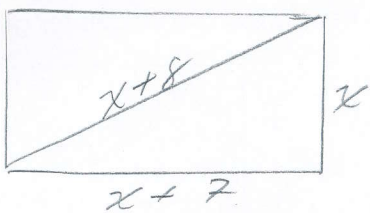
Name: Key

Alg. 1 H - Date: May 6

HW: Applying the Pythagorean Theorem Worksheet

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Example 3: The "Tiny Tots" day care center has a rectangular, fenced play area behind its building. The play area is $(x + 7)$ meters long and x meters wide. The pathway is $(x + 8)$ meters long. Find, to the nearest meter, the length of a pathway that runs along the diagonal of the play area.



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

$$x^2 + (x+7)^2 = (x+8)^2$$

$$x^2 + x^2 + 14x + 49 = x^2 + 16x + 64$$

$$2x^2 + 14x + 49 = x^2 + 16x + 64$$

$$-x^2 - 2x - 15 = 0$$

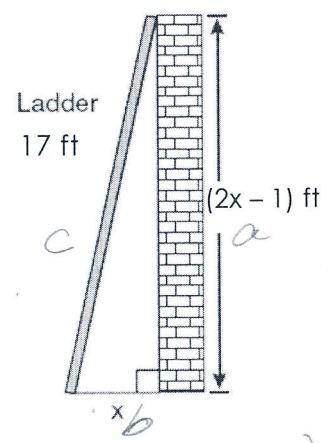
$$(x-5)(x+3) = 0$$

$x = 5$ $x = -3$
 reject bc no neg. side

$x+8$ ans:
 $5+8$
 13m is the length of the pathway.

Example 4: Brandon placed a ladder against the side of his house as shown in the diagram below so he can remove the leaves in the gutter.

Write an equation that could be used to find the distance, x , from the foot of the ladder to the base of the house? Then solve for x .



$$(2x-1)(2x-1)$$

| | | |
|------|--------|-------|
| | $2x$ | -1 |
| $2x$ | $4x^2$ | $-2x$ |
| -1 | $-2x$ | $+1$ |

$$4x^2 - 4x + 1$$

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

$$-1440$$

$$-40 \quad 36$$

$$-4$$

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

$$x^2 + (2x-1)^2 = 17^2$$

$$x^2 + 4x^2 - 4x + 1 = 289$$

$$5x^2 - 4x + 1 = 289$$

$$-289 - 289$$

$$5x^2 - 4x - 288 = 0$$

bottoms up

$$(x - \frac{40}{5})(x + \frac{36}{5}) = 0$$

$$(x-8)(5x+36) = 0$$

$$x = 8$$

$$5x + 36 = 0$$

$$-36 - 36$$

$$\frac{5x}{5} = \frac{-36}{5}$$

$x = 8 \text{ ft}$

$x = \frac{-36}{5}$
 reject bc no neg. length