

HW: Factoring Word Problems/20, 24, ~~20~~

Warm up: x $19-x$

Find two numbers that have a sum of 19 and a product of 48.

$$x(19-x) = 48$$

$$19x - x^2 = 48$$

$$0 = x^2 - 19x + 48$$

$$0 = (x-16)(x-3)$$

$$x = 16, 3$$

3 and 16

HW Solutions $(x+2)(x+2)$

G

$$x^2 + (x+2)^2 = 340$$

$$x^2 + x^2 + 4x + 4 = 340$$

$$\frac{2x^2 + 4x - 336}{2} = \frac{0}{2}$$

$$x^2 + 2x - 168 = 0$$

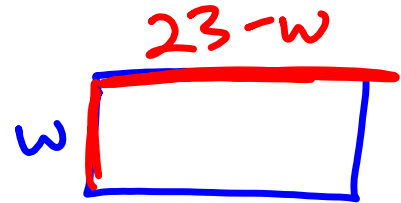
$$(x+14)(x-12) = 0$$

$$\begin{array}{r} x+14=0 \\ -14 \quad -14 \\ \hline x = -14 \end{array}$$

$$x = \cancel{-14} \quad 12$$

12 and 14

$$\begin{array}{r}
 (4) \quad 2w + 2l = 46 \\
 \underline{-2w} \qquad \underline{-2w} \\
 2l = 46 - 2w \\
 \underline{\quad \quad \quad 2} \\
 l = 23 - w
 \end{array}$$



9m x 14m

$$\begin{aligned}
 w(23-w) &= 126 \\
 23w - w^2 &= 126 \\
 \downarrow w^2 \quad \downarrow -23w \\
 0 &= w^2 - 23w + 126 \\
 0 &= (w - 9)(w - 14) \\
 w &= 9, 14
 \end{aligned}$$

(13)

$$x^2 + (25 - x)^2 = 313$$

$$x^2 + 625 - 50x + x^2 = 313$$

$$- 313$$

$$- 313$$

$$2x^2 - 50x + 312 = 0$$

$$2$$

$$2$$

$$x \quad 25-x$$

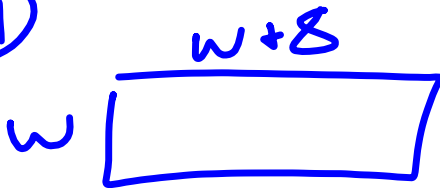
$$x^2 - 25x + 156 = 0$$

$$(x - 12)(x - 13) = 0$$

$$x = 12, 13$$

12 and
13

(9)



7cm x 15cm

$$w(w+8) = 105$$

$$w^2 + 8w = 105$$

$$w^2 + 8w - 105 = 0$$

$$(w+15)(w-7) = 0$$

$$w = -\cancel{15}, 7$$

$$\textcircled{3} \quad x^2 - 30 = x$$

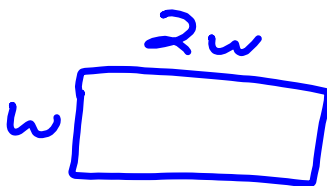
$$x^2 - x - 30 = 0 \quad x = x^2 - 30$$

$$(x-6)(x+5) = 0$$

$$x = 6, -\cancel{5}$$

$\textcircled{6}$

Originally a rectangle was twice as long as it was wide. When 4m were added to its length and 3m subtracted from its width, the resulting rectangle had an area of 600m^2 . Find the dimensions of the new rectangle.



$15\text{m} \times 47\text{m}$

$$(w-3)(2w+4) = 600$$

$$2w^2 - 2w - 12 = 600$$

$$\begin{array}{r} 2w^2 - 2w - 12 = 600 \\ -600 \quad -600 \\ \hline 2w^2 - 2w - 612 = 0 \end{array}$$

$$\begin{array}{r} 2w^2 - 2w - 612 = 0 \\ \hline w^2 - w - 306 = 0 \end{array}$$

$$(w-18)(w+17) = 0$$

$$w = 18, \quad \cancel{-17}$$

A rocket is fired upward with an initial velocity of 160ft/s. When is the rocket 400ft high? How do you know that 400ft is the greatest height the rocket reaches?

$$h = vt - 16t^2$$

$$400 = 160t - 16t^2$$

$$\frac{16t^2 - 160t + 400 = 0}{4} \quad \frac{0}{4}$$

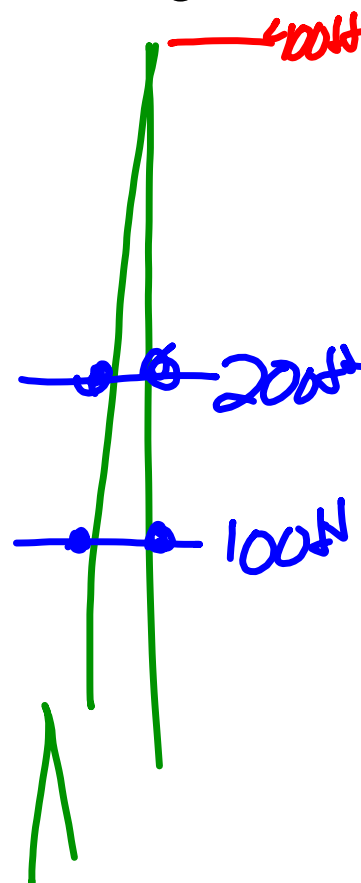
$$\frac{4t^2 - 40t + 100 = 0}{4} \quad \frac{0}{4}$$

$$t^2 - 10t + 25 = 0$$

$$(t - 5)^2 = 0$$

$$t = 5$$

$$\text{5s}$$



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Vanessa built a rectangular pen for her dogs. She used an outside wall of the garage for one of the sides of the pen. She has to buy 20 m of fencing in order to build the other sides of the pen. Find the dimensions of the pen if its area is 48 m^2 .

$$x = 6, 4$$

$$x(20 - 2x) = 48$$

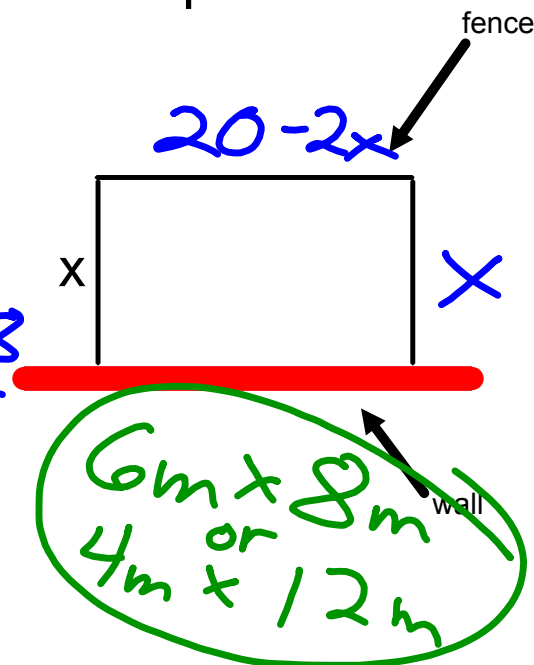
$$20x - 2x^2 = 48$$

$$0 = 2x^2 - 20x + 48$$

$$\frac{0}{2} = \frac{2x^2 - 20x + 48}{2}$$

$$0 = x^2 - 10x + 24$$

$$0 = (x - 6)(x - 4)$$



A 50 m by 120 m park consists of a rectangular lawn surrounded by a path of uniform width. Find the dimensions of the lawn if its area is the same as the area of the path.

Each edge of one cube is 2 cm longer than each edge of another cube. The volumes of the cubes differ by 98 cm^3 . Find the lengths of the edges of each cube.