Warm-Up 5/9/19

Solve:

1. $x^2 - 10x + 21 = 0$

$ac = 21$

$-3 \mid -7$

$(x^2 - 3x)(-7x + 21) = 0$

$x(x-3) - 7(x-3) = 0$

$(x-7)(x-3) = 0$

$x - 7 = 0 \quad x - 3 = 0$

$\{3, 7\}$

2. $9x^2 = 36$

$-36 \quad -36$

$9x^2 - 36 = 0$

$9(x^2 - 4) = 0$

$9(x+2)(x-2) = 0$

$9 \neq 0 \quad x+2=0 \quad x-2=0$

$\{-2, 2\}$

3. $y = 3x^2 + 6x - 45$

$a = 3 \quad b = 6 \quad c = -45$

$3(x^2 + 2x - 15)$

$ac = -15$

$-3 \mid 5$

$(x^2 - 3x)(5x - 15) = 0$

$x(x-3)\,5(x-3) = 0$

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

$x+5=0 \quad x-3=0$

$\{-5, 3\}$

$x = -1$

Roots: $\{-5, 3\}$

Vertex $(-1, -48)$

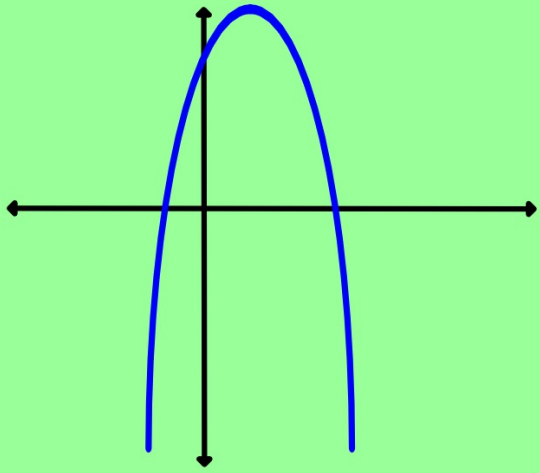
Min or Max?

$y = 3(-1)^2 + 6(-1) - 45$

$3 - 6 - 45$

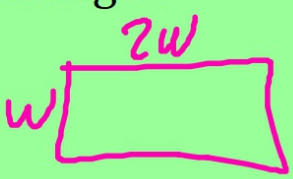
$-3 - 45 = -48$

Quadratic Equations: Area& Square of a Number Application



Area Application Problems

1. The length of a rectangle is 2 times its width. The area of the rectangle is 72 square inches. Find the dimensions of the rectangle.



$w(2w)=72$

$2w^2=72$

$-72 \quad -72$

$2w^2-72=0$

$2(w^2-36)=0$

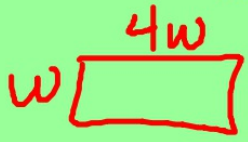
$2(w+6)(w-6)=0$

$w+6=0 \qquad w-6=0$

$w=-6 \qquad w=6$

Width
6 in
length
12 in

2. The length of a rectangle is 4 times its width. The area of the rectangle is 144 square inches. Find the dimensions of the rectangle.



$w(4w) = 144$

$4w^2 = 144$

$-144 \quad -144$

$4w^2 - 144 = 0$

$4(w^2 - 36) = 0$

$(w+6)(w-6) = 0$

$w+6=0 \quad w-6=0$

$w \neq -6 \quad w = 6$

width
6 in
length
24 in

You Try:

1. The width of a rectangle is 5 meters less than its length. The area is 84 square meters. Find the dimensions of the rectangle.

2. The length of a rectangle is twice the width. The area is 50 square inches. Find the dimensions of the rectangle.

Square of a number

1. Eight more than the square of a number is the same as 6 times the number. Find the number.

+ x^2 =

MUH. x

$8 + x^2 = 6x$

$-6x \quad -6x$

$x^2 - 6x + 8 = 0$

$ac = 8$

$-4 \mid -2$

$(x^2 - 4x)(-2x + 8) = 0$

$x(x-4) - 2(x-4) = 0$

$(x-2)(x-4) = 0$

$x - 2 = 0$ $\quad$ $x - 4 = 0$

$x = 2$ $\quad$ $x = 4$

2. Fifteen less than the square of a number is the same as twice the number. Find the number.

x^2 $=$ 2 x

$x^2 - 15 = 2x$

$-2x \quad -2x$

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

$ac = -15$

$-5 \mid 3$

$(x^2 - 5x)(+3x - 15) = 0$

$x(x-5)\,3(x-5) = 0$

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

$x+3=0 \qquad x-5=0$

$x=-3 \qquad x=5$

3. If a number is added to twice its square, the result is 6. Find the number.

x + 2 x^2 =

$2x^2+x=6$

$2x^2+x-6=0$

$(2x^2+4x)-3x-6=0$

$2x(x+2)-3(x+2)=0$

$(2x-3)(x+2)=0$

$2x-3=0$

$+3\ +3$

$\frac{2x}{2}=\frac{3}{2}$

$x=3/2$

$x+2=0$

$x=-2$

$ac=-12$

$4\ |\ -3$

4. Seven less than 4 times the square of a number is 18. Find the number.

$4x^2 - 7 = 18$

$-18 \quad -18$

$4x^2 - 25 = 0$

$(2x+5)(2x-5) = 0$

$2x+5=0 \qquad 2x-5=0$

$-5 \quad -5 \qquad +5 \quad +5$

$2x=-5 \qquad 2x=5$

$x=-5/2 \qquad x=5/2$

Complete #1 - 4 on the

AREA PRACTICE
worksheet