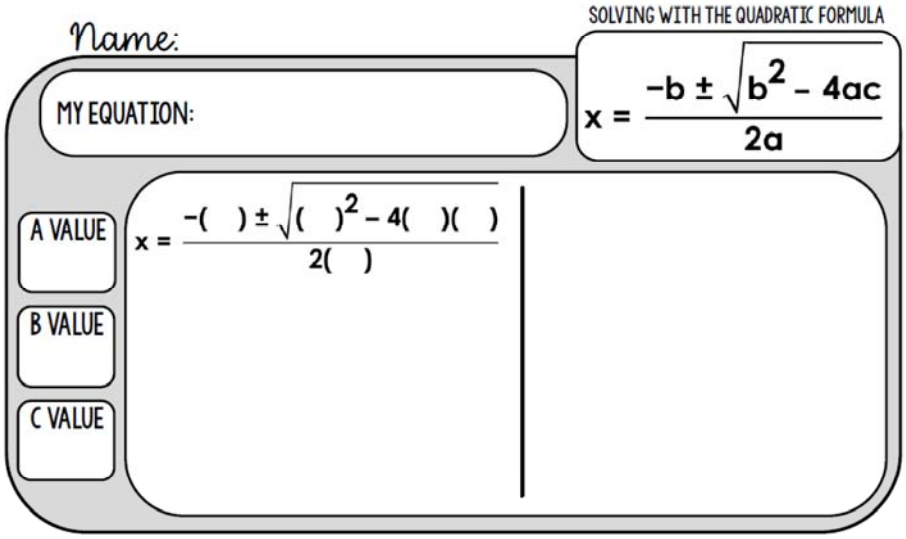
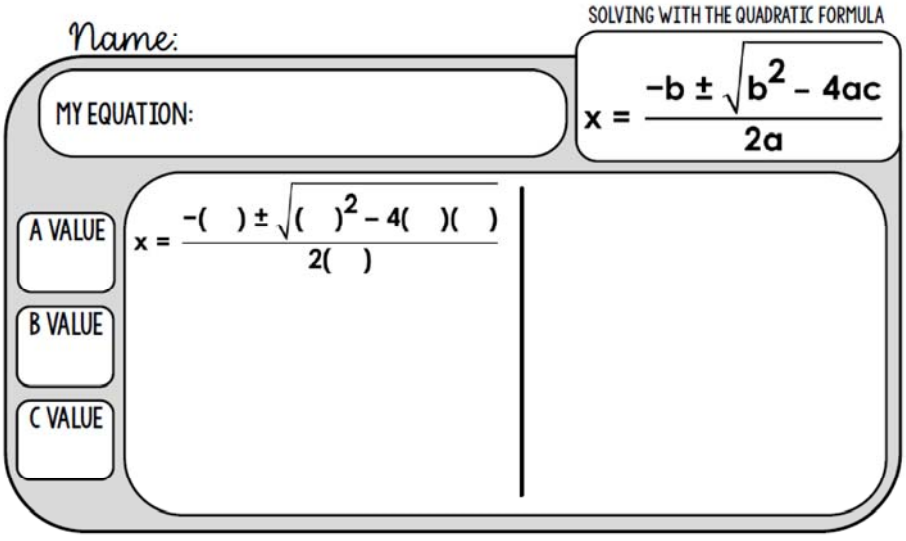
Warm-up 4/18

Solve the following quadratics using completing the square, the quadratic formula, and factoring (if you can).

1. $x^2 - 3x - 15 = 0$



2. $x^2 + 4x = -4$



Warm-up 4/18

Solve the following quadratics using completing the square, the quadratic formula, and factoring (if you can).

1. $x^2 - 3x - 15 = 0$ cannot be factored

Name:

SOLVING WITH THE QUADRATIC FORMULA

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

MY EQUATION: $x^2 - 3x - 15 = 0$

A VALUE 1
B VALUE -3
C VALUE -15

$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(-15)}}{2(1)}$

$x = \frac{3 \pm \sqrt{9 + 60}}{2}$

$x = \frac{3 \pm \sqrt{69}}{2}$

$x = \frac{3 + \sqrt{69}}{2}$ $x = \frac{3 - \sqrt{69}}{2}$

$x^2 - 3x - 15 = 0$

$+15 \quad +15$

$x^2 - 3x + \frac{9}{4} = 15 + \frac{9}{4}$ $\left(+\left(\frac{b}{2}\right)^2\right)$

$\sqrt{\left(x - \frac{3}{2}\right)^2} = \sqrt{\frac{69}{4}}$

$x - \frac{3}{2} = \pm \frac{\sqrt{69}}{2}$

$x - \frac{3}{2} = \frac{\sqrt{69}}{2}$ $x - \frac{3}{2} = \frac{-\sqrt{69}}{2}$

$+\frac{3}{2} \quad +\frac{3}{2}$ $+\frac{3}{2} \quad +\frac{3}{2}$

$x = \frac{3 + \sqrt{69}}{2}$ $x = \frac{3 - \sqrt{69}}{2}$

2. $x^2 + 4x = -4$

$+4 \quad +4$

Name:

SOLVING WITH THE QUADRATIC FORMULA

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

MY EQUATION: $x^2 + 4x + 4 = 0$

A VALUE 1
B VALUE 4
C VALUE 4

$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(4)}}{2(1)}$

$x = \frac{-4 \pm \sqrt{16 - 16}}{2}$

$x = \frac{-4 \pm \sqrt{0}}{2}$

$x = \frac{-4}{2}$

$x = -2$

$x^2 + 4x + 4 = 0$

$4x^2$, $2x$, $2x$, $4x$

	x	2
x	x^2	$2x$
2	$2x$	4

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

$(x+2)^2 = 0$

$x + 2 = 0$

$-2 \quad -2$

$x = -2$

$x^2 + 4x + 4 = -4 + 4$ $\left(\frac{b}{2}\right)^2$

$\sqrt{(x+2)^2} = \sqrt{0}$

$x + 2 = 0$

$-2 \quad -2$

$x = -2$

Solving, Graphing, and Analyzing Quadratic Functions

Factor to find the x-intercepts of the function:

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

$2(x+1)(x-3)=0$

$x+1=0$ $\quad x-3=0$

$x=-1$ $\quad x=3$

Use the Quadratic Formula to find the roots of the function: $a=2$ $b=-4$ $c=-6$

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

$$x=\frac{-(-4)\pm\sqrt{(-4)^2-4(2)(-6)}}{2(2)}$$

$$x=\frac{4\pm\sqrt{16+48}}{4}$$

$$x=\frac{4\pm\sqrt{64}}{4}$$

$$x=\frac{4\pm 8}{4}$$

$x=\frac{4+8}{4}=3$ $\quad x=\frac{4-8}{4}=-1$

$x=3$, $x=-1$

Solve by Completing the Square: $\left(\frac{b}{2}\right)^2$

$$\frac{2x^2}{2}-\frac{4x}{2}=\frac{6}{2}$$

$$x^2-2x+1=3+1$$

$$\sqrt{(x-1)^2}=\sqrt{4}$$

$$x-1=\pm 2$$

$x-1=2$, $+1\ +1$, $x=3$ $\quad x-1=-2$, $+1\ +1$, $x=-1$

Use the discriminant to determine the number of real zeros:

$b^2-4ac=64$

$(-4)^2-4(1)(-6)$

$16+48=64$

2 solutions

Function:

$$f(x)=2x^2-4x-6$$

concave up or down: up

axis of symmetry: $x=1$

$x=\frac{-b}{2a}=\frac{-(-4)}{2(2)}=1$

vertex coordinate: $(1,-8)$

$f(1)=2(1)^2-4(1)-6$

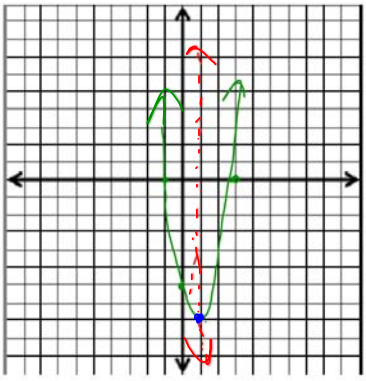
$=2-4-6=-8$

vertex a min or max: min

y-intercept: $y=-6$ $(0,-6)$

number of zeros: 2 zeros

zeros (if any): $(-1,0)$ $(3,0)$



Domain: $(-\infty,\infty)$

Range: $y\geq -8$

Name: _____

Date: _____

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Homework

pg. 1-2 (NOT 1-2, 14-15, and 19-20)

If you want to redo the quiz, 4 problems from 21-40 using the quadratic formula to solve.