

AGENDA

- 1) Take out HW to be Checked
- 2) DO NOW
 - Different Methods to Find Roots
- 3) Intro to **Quadratic Formula**
 - a) Finding Vertex
 - b) Discriminant
 - c) Finding Roots
- 4) Stations
 - Graphing Parabolas with Quadratic Formula
- 5) Exit Ticket

HW: Solving Quadratic Equations with the Quadratic Formula

DO NOW**Solving Quadratic Equations**

What does it mean to "**Solve**" a quadratic equation?

Solve by Factoring

1) $n^2 = -18 - 9n$

2) $7x^2 + 2x = 0$

Solve using Square Roots

3) $9r^2 - 5 = 607$

Solve by Completing the Square

4) $a^2 + 14a - 51 = 0$

One more method to **Solve** for the **Roots** of Quadratic Equations...

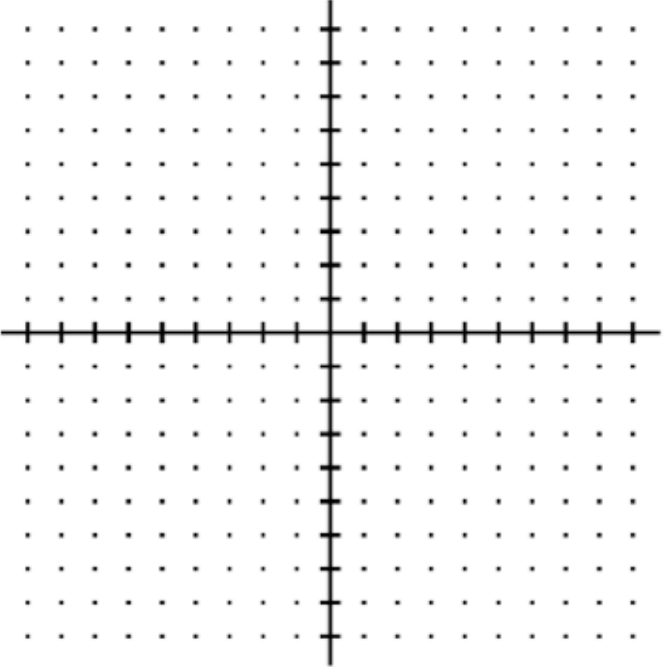
$$y = ax^2 + bx + c$$

Using the **Quadratic Formula**

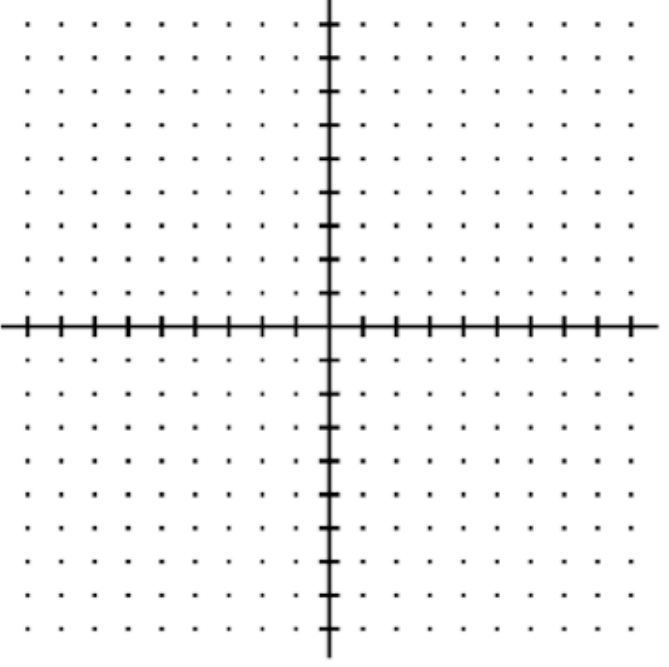
$$x = \frac{-(b) \pm \sqrt{(b)^2 - 4(a)(c)}}{2(a)}$$

x-value of Vertex:	y-value of Vertex:
$x = \frac{-(b)}{2(a)}$	$y = ax^2 + bx + c$
Discriminant: $\sqrt{(b)^2 - 4(a)(c)}$	

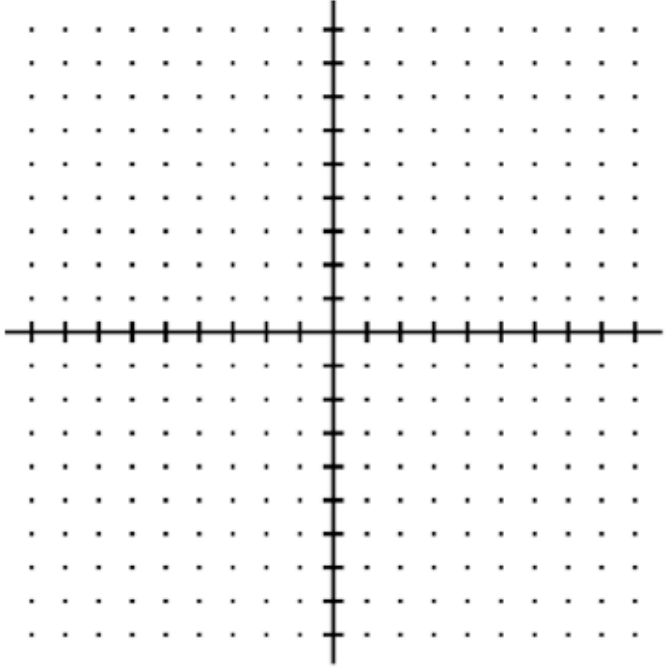
DEMO: Graph Parabolas Using Quadratic Formula

<p>Given the equation: $y = 4x^2 + x - 5$</p>	<p>What is the vertex?</p>
<p>Identify: $a = \underline{\quad}$ $b = \underline{\quad}$ $c = \underline{\quad}$</p> <p>Is the parabola opening up or down? (Circle one)</p> <p>What is the coordinate of the y- intercept? $(\underline{\quad}, \underline{\quad})$</p>	<p>x-value: $x = \frac{-(b)}{2(a)}$</p> <p>y-value:</p> <p>coordinate of vertex: $(\underline{\quad}, \underline{\quad})$</p>
<p>Find the Root(s) Using Quadratic Formula:</p>	<p>Graph the Parabola (include vertex, root(s), y-intercept & symmetrical point)</p>
<p>$x = \frac{-(\) \pm \sqrt{(\)^2 - 4(\)(\)}}{2(\)}$</p>	

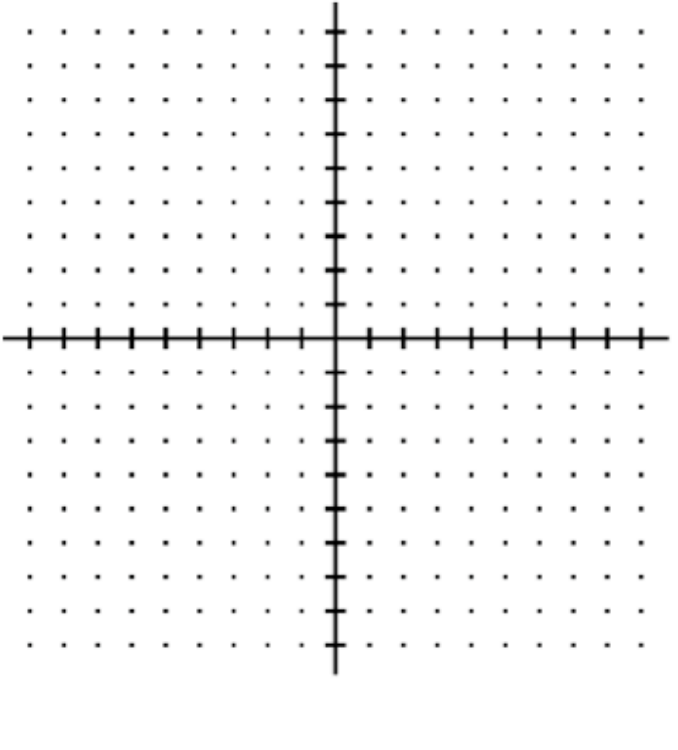
Station 1: Graph Parabolas Using Quadratic Formula

<p>Given the equation: $y = x^2 - 18x + 86$</p>	<p>What is the vertex?</p>
<p>Identify: $a = \underline{\quad}$ $b = \underline{\quad}$ $c = \underline{\quad}$</p> <p>Is the parabola opening up or down? (Circle one)</p> <p>What is the coordinate of the y-intercept? $(\underline{\quad}, \underline{\quad})$</p>	<p>x-value: $x = \frac{-(b)}{2(a)}$</p> <p>y-value:</p> <p>coordinate of vertex: $(\underline{\quad}, \underline{\quad})$</p>
<p>Find the Root(s) Using Quadratic Formula:</p>	<p>Graph the Parabola (include vertex, root(s), y-intercept & symmetrical point)</p>
<p>$x = \frac{-(\) \pm \sqrt{(\)^2 - 4(\)(\)}}{2(\)}$</p>	

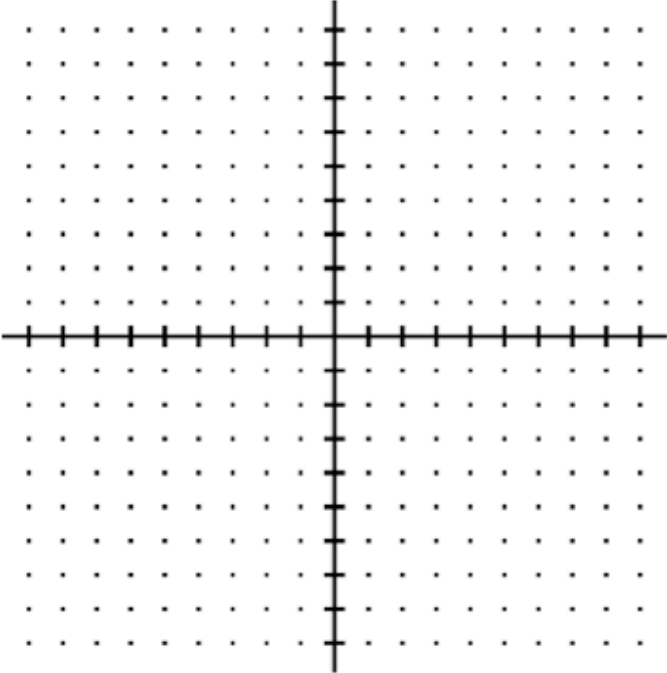
Station 2: Graph Parabolas Using Quadratic Formula

<p>Given the equation: $y = -2x^2 - 20x - 46$</p>	<p>What is the vertex?</p>
<p>Identify: $a = \underline{\quad}$ $b = \underline{\quad}$ $c = \underline{\quad}$</p> <p>Is the parabola opening up or down? (Circle one)</p> <p>What is the coordinate of the y-intercept? $(\underline{\quad}, \underline{\quad})$</p>	<p>x-value: $x = \frac{-(b)}{2(a)}$</p> <p>y-value:</p> <p>coordinate of vertex: $(\underline{\quad}, \underline{\quad})$</p>
<p>Find the Root(s) Using Quadratic Formula:</p>	<p>Graph the Parabola (include vertex, root(s), y-intercept & symmetrical point)</p>
<p>$x = \frac{-\underline{(\quad)} \pm \sqrt{(\underline{(\quad)})^2 - 4(\underline{(\quad)})(\underline{(\quad)})}}{2(\underline{(\quad)})}$</p>	

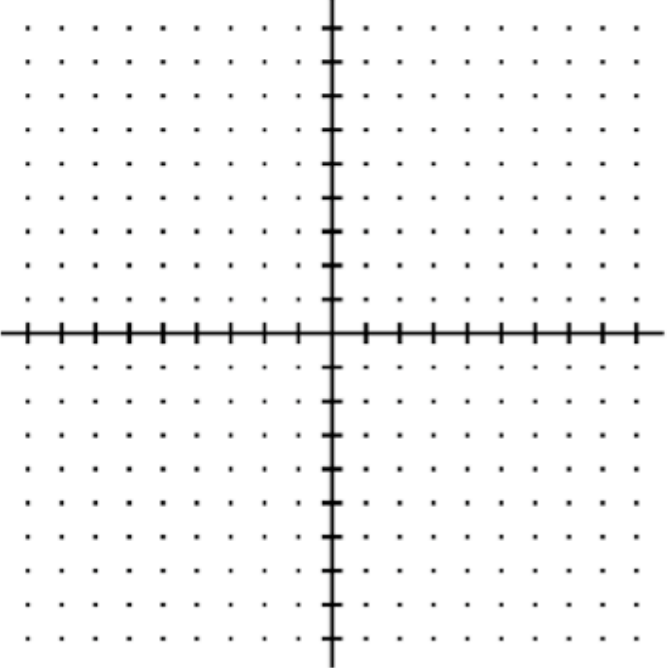
Station 3: Graph Parabolas Using Quadratic Formula

<p>Given the equation: $y = 3x^2 - 54x + 241$</p>	<p>What is the vertex?</p>
<p>Identify: $a = \underline{\quad}$ $b = \underline{\quad}$ $c = \underline{\quad}$</p> <p>Is the parabola opening up or down? (Circle one)</p> <p>What is the coordinate of the y-intercept? $(\underline{\quad}, \underline{\quad})$</p>	<p>x-value: $x = \frac{-(b)}{2(a)}$</p> <p>y-value:</p> <p>coordinate of vertex: $(\underline{\quad}, \underline{\quad})$</p>
<p>Find the Root(s) Using Quadratic Formula:</p>	<p>Graph the Parabola (include vertex, root(s), y-intercept & symmetrical point)</p>
<p>$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$</p>	

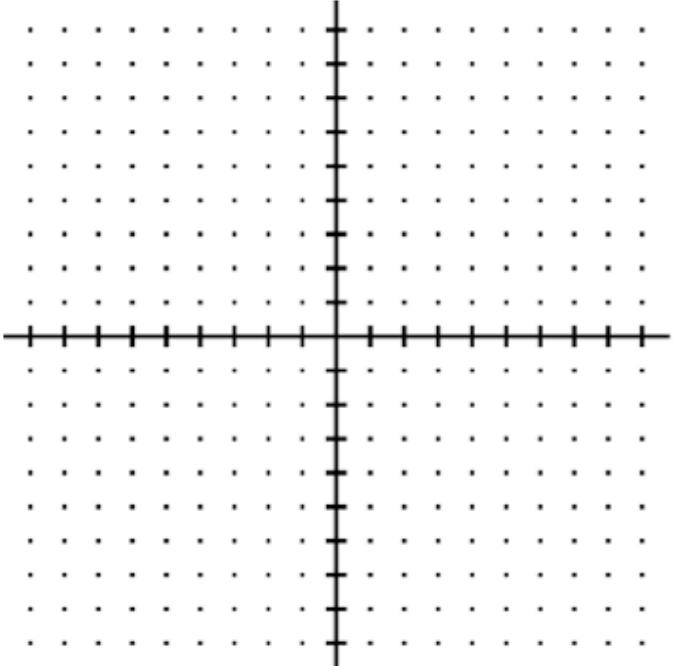
Station 4: Graph Parabolas Using Quadratic Formula

<p>Given the equation:</p> $y = -\frac{1}{4}x^2 + 7$	<p>What is the vertex?</p>
<p>Identify: a = _____ b = _____ c = _____</p> <p>Is the parabola opening up or down? (Circle one)</p> <p>What is the coordinate of the y-intercept? (____, ____)</p>	<p>x-value: $x = \frac{-(b)}{2(a)}$</p> <p>y-value:</p> <p>coordinate of vertex: (____, ____)</p>
<p>Find the Root(s) Using Quadratic Formula:</p>	<p>Graph the Parabola (include vertex, root(s), y-intercept & symmetrical point)</p>
$x = \frac{-(\) \pm \sqrt{(\)^2 - 4(\)(\)}}{2(\)}$	

Station 5: Graph Parabolas Using Quadratic Formula

<p>Given the equation: $y = x^2 - 12x + 44$</p>	<p>What is the vertex?</p>
<p>Identify: a = _____ b = _____ c = _____</p> <p>Is the parabola opening up or down? (Circle one)</p> <p>What is the coordinate of the y- intercept? (____, ____)</p>	<p>x-value: $x = \frac{-(b)}{2(a)}$</p> <p>y-value:</p> <p>coordinate of vertex: (____, ____)</p>
<p>Find the Root(s) Using Quadratic Formula:</p>	<p>Graph the Parabola (include vertex, root(s), y-intercept & symmetrical point)</p>
<p>$x = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$</p>	

Station 6: Graph Parabolas Using Quadratic Formula

<p>Given the equation: $y = -x^2 - 6x - 10$</p>	<p>What is the vertex?</p>
<p>Identify: $a = \underline{\hspace{1cm}}$ $b = \underline{\hspace{1cm}}$ $c = \underline{\hspace{1cm}}$</p> <p>Is the parabola opening up or down? (Circle one)</p> <p>What is the coordinate of the y-intercept? $(\underline{\hspace{1cm}}, \underline{\hspace{1cm}})$</p>	<p>x-value: $x = \frac{-(b)}{2(a)}$</p> <p>y-value:</p> <p>coordinate of vertex: $(\underline{\hspace{1cm}}, \underline{\hspace{1cm}})$</p>
<p>Find the Root(s) Using Quadratic Formula:</p>	<p>Graph the Parabola (include vertex, root(s), y-intercept & symmetrical point)</p>
<p>$x = \frac{-(\) \pm \sqrt{(\)^2 - 4(\)(\)}}{2(\)}$</p>	

Score: _____/7

Name _____

Block _____

Exit Ticket:**Solve for the Root(s)** Using the Quadratic Formula. Show all work.

$$y = 3x^2 - 33x + 72$$

a = _____ b = _____ c = _____

Score: _____/7

Name _____

Block _____

Exit Ticket:**Solve for the Root(s)** Using the Quadratic Formula. Show all work.

$$y = 7x^2 + 35x - 42$$

a = _____ b = _____ c = _____

HW: Solving Quadratic Equations with the Quadratic Formula

Using the Quadratic Formula

$$x = \frac{-(b) \pm \sqrt{(b)^2 - 4(a)(c)}}{2(a)}$$

Solve each equation with the quadratic formula.

The first one has been done for you.

1) $v^2 + 2v - 8 = 0$

$a=1$ $b=2$ $c=-8$

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-8)}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{4 - (-32)}}{2}$$

$$x = \frac{-2 \pm \sqrt{36}}{2}$$

$$x = \frac{-2 + 6}{2} \rightarrow \boxed{x=2}$$

$$x = \frac{-2 \pm 6}{2}$$

$$x = \frac{-2 - 6}{2} \rightarrow \boxed{x=-4}$$

3) $2v^2 - 5v + 3 = 0$

2) $k^2 + 5k - 6 = 0$

$a=$ $b=$ $c=$

4) $2a^2 - a - 13 = 2$

$$\begin{array}{r} -2 \quad -2 \\ \hline 2a^2 - a - 15 = 0 \end{array}$$

$$2a^2 - a - 15 = 0$$

$a=2$ $b=-1$ $c=-15$

Use this strategy for the problems on the back too!

5) $2n^2 - n - 4 = 2$

6) $b^2 - 4b - 14 = -2$

7) $8n^2 - 4n = 18$

8) $8a^2 + 6a = -5$

9) $10x^2 + 9 = x$

10) $n^2 = 9n - 20$

Using the Quadratic Formula

Date _____

Solve each equation with the quadratic formula.

1) $v^2 + 2v - 8 = 0$

$\{2, -4\}$

2) $k^2 + 5k - 6 = 0$

$\{1, -6\}$

3) $2v^2 - 5v + 3 = 0$

$\left\{\frac{3}{2}, 1\right\}$

4) $2a^2 - a - 13 = 2$

$\left\{3, -\frac{5}{2}\right\}$

5) $2n^2 - n - 4 = 2$

$\left\{2, -\frac{3}{2}\right\}$

6) $b^2 - 4b - 14 = -2$

$\{6, -2\}$

7) $8n^2 - 4n = 18$

$\left\{\frac{1 + \sqrt{37}}{4}, \frac{1 - \sqrt{37}}{4}\right\}$

8) $8a^2 + 6a = -5$

Negative under the radical
NO ROOTS

9) $10x^2 + 9 = x$

Negative under the radical
NO ROOTS

10) $n^2 = 9n - 20$

$\{5, 4\}$