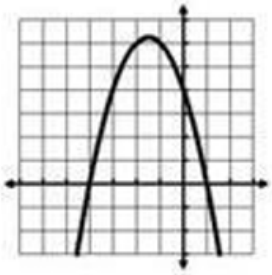
Warm-Up Quick Check - Graphing

1. Which of the graphs below best represents the function $f(x) = (x + 4)(x - 1)$?

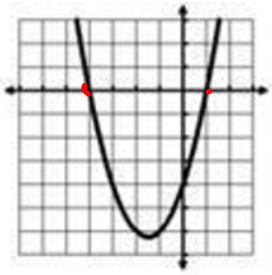
x-int: −4, 1

A.

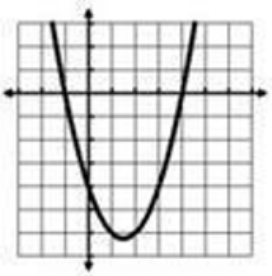


0:00:00

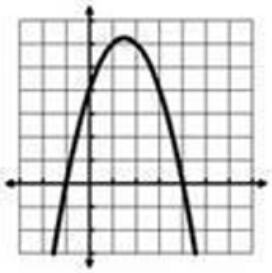
C.



B.



D.



2. Determine which graph matches the characteristics of $f(x) = -x^2 - 4x + 5$

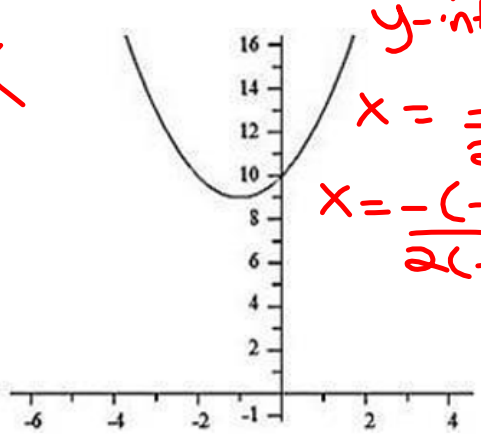
a = −1 b = −4 c = 5

y-int: (0, 5)

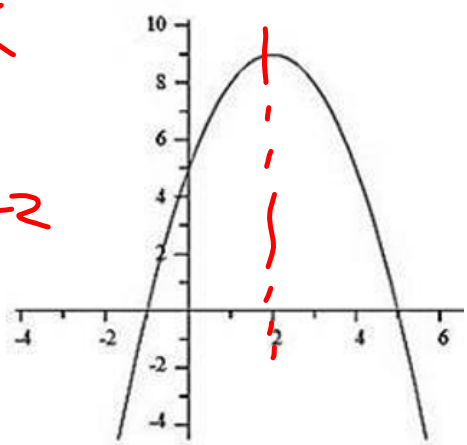
$x = \frac{-b}{2a}$

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

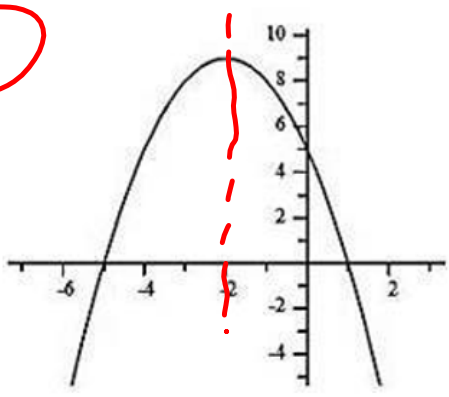
A.



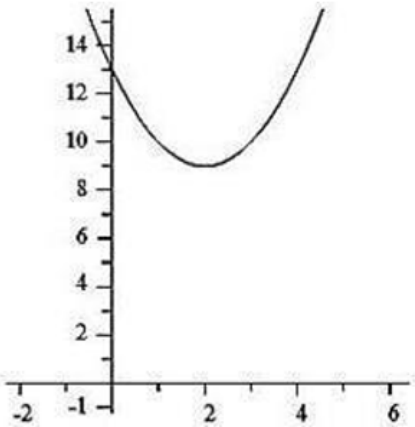
C.



B.



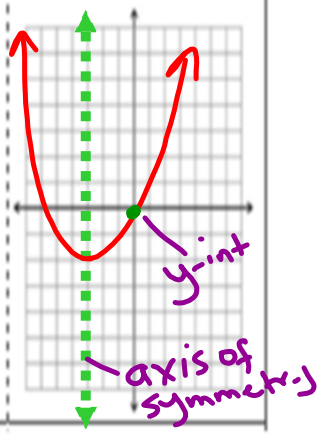
D.

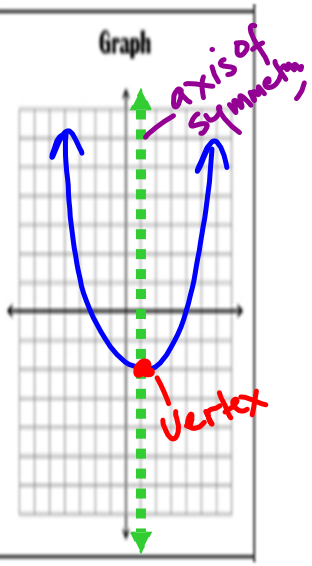


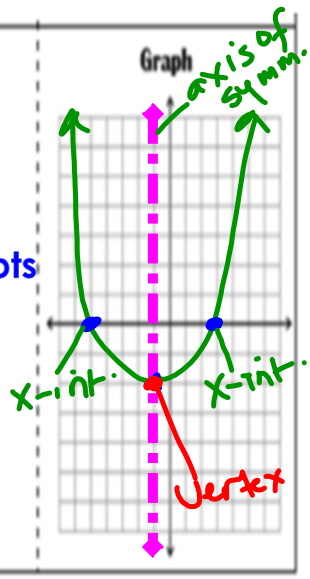
Agenda for 3/7/18

1. Warm-Up: Quick Check (5 mins)
2. Glue-in Orange Foldable in your note book (3 mins)
3. Day 8.5 Converting between Forms (30 mins)
4. Unit 3B Quiz 2 (45 mins)

PUTTING IT ALL TOGETHER!

Standard Form $F(x)=ax^2+bx+c$	Axis of Symmetry	Vertex	Intercepts/Roots	Graph
	$x = \frac{-b}{2a}$	$\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right)$	Y-intercept (0, C)	

Vertex Form	Axis of Symmetry	Vertex	Intercepts/Roots	Graph
$f(x) = a(x - h)^2 + k$, where (h, k) is the vertex of the parabola.	X = h * h is opposite sign in the equation	(h, k) * H is opposite sign in the equation	N/A	

Intercept Form $y=a(x-p)(x-q)$, where p and q are x intercepts (roots)	Axis of Symmetry	Vertex	Intercepts/Roots	Graph
	$x=\frac{p+q}{2}$ * P and q are opposite signs in the equation	$\left(\frac{p+q}{2}, f\left(\frac{p+q}{2}\right)\right)$ * P and q are opposite signs in the equation	X-intercepts (p, 0) (q, 0)	

Graphing Vertex Form

$$y = a(x - h)^2 + k$$

(h, k) is the vertex

To Graph:

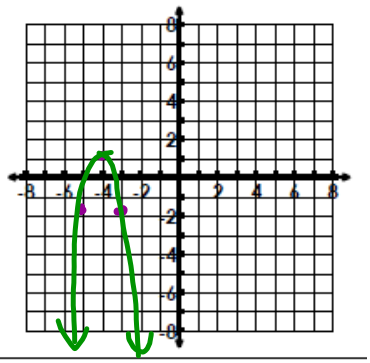
1. Determine vertex.
2. Place vertex in middle of x-y table.
3. Create two x-values to the right and left of the vertex.
4. Use the table feature in graphing calculator or substitute each x-value into equation to find the y-values.
5. Plot points and connect.

Example

Graph $y = -3(x + 4)^2 + 1$.

$V = (-4, 1)$

x	y
-6	-11
-5	-2
-4	1
-3	-2
-2	-11



Graphing **Standard Form**

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

(0, c) is the y-intercept

To Graph:

1. Label a, b, c.
2. Use $x = \frac{-b}{2a}$ to find x-value of vertex.
3. Substitute x-value into the equation to find y-value.
4. Place vertex in middle of x-y table.
5. Create two x-values to the right and left of the vertex.
6. Use the table feature in graphing calculator or substitute each x-value into equation to find the y-values.
7. Plot points and connect.

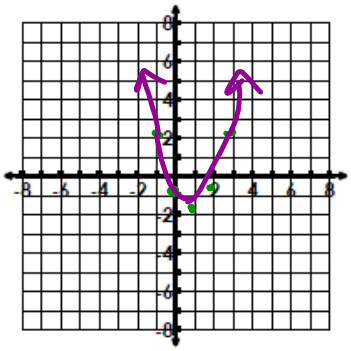
Example

Graph $y = x^2 - 2x - 1$

$a = 1 \quad b = -2 \quad c = -1$

y-int = $(0, -1)$ $V = (1, -2)$

x	y
-1	2
0	-1
1	-2
2	-1
3	2



$x = \frac{-b}{2a}$

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

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

$f(1) = -2$

$(-1)^2 - 2(-1) - 1$

$1 + 2 - 1$

Factoring Difference of Squares

$y = x^2 - 9$

$y = (x+3)(x-3)$

$y = a^2 - b^2$

$y = (a+b)(a-b)$

Graphing Intercept Form $y = a(x - p)(x - q)$

(p, 0) & (q, 0) are x-intercepts

To Graph:

1. Identify your x-intercepts.
2. Use the formula $x = \frac{p+q}{2}$ to find x-value of the vertex.
3. Substitute x-value into the equation to find y-value.
4. Plot intercepts and vertex.

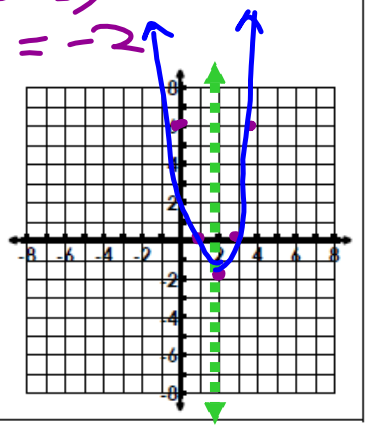
*You can always create an x-y table and plot more than the three points.

Example

Graph $y = 2(x - 1)(x - 3)$

$f(2) = 2(2-1)(2-3)$

$2(1)(-1) = -2$



x-intercepts:

$x = 1, 3$

$x = (1,0)$ $(3,0)$

vertex:

$x = \frac{1+3}{2} = 2$

$(2,-2)$

$1^2 = 1 \cdot 2 = 2$

$2^2 = 4 \cdot 2 = 8$

Day 8.5 Converting between Forms

Use both Graphic Organizers!

Intercept to Standard

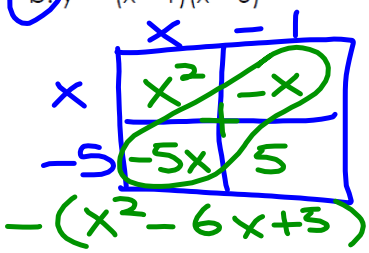
Directions: Convert from intercept form to standard form. Then name the y-intercept.

a. $y = (x - 3)(x + 4)$

Form: _____

Y-int: _____

b. $y = -(x - 1)(x - 5)$



Form: $y = -x^2 + 6x - 5$

Y-int: _____

c. $y = 2(x + 5)(x + 1)$

Form: _____

Y-int: _____

Vertex to Standard

Directions: Convert from vertex form to standard form. Then name the y-intercept.

a. $y = (x + 5)^2 - 2$

Form: _____

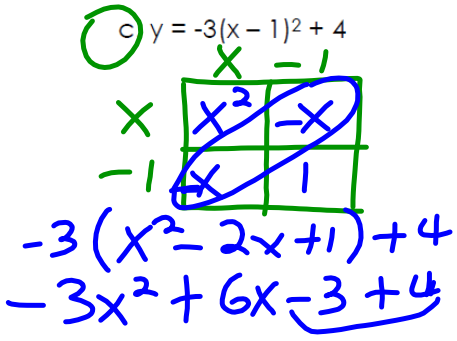
Y-int: _____

b. $y = -(x - 2)^2 + 6$

Form: _____

Y-int: _____

c) $y = -3(x - 1)^2 + 4$



Form: $y = -3x^2 + 6x + 1$

Y-int: _____

Standard to Intercept

Directions: Convert from standard form to intercept form. Then name the x-intercepts.

a. $y = x^2 + 2x - 15$

Form: _____

X-int: _____

b. $y = x^2 - 5x - 14$

Form: _____

X-int: _____

c. $y = -x^2 + 3x + 4$

$-(x^2 - 3x - 4)$

-4, -4, 1, -3

$y = -(x-4)(x+1)$

Form: _____

X-int: $4, -1$

Standard to Vertex

Directions: Convert from standard form to vertex form. Then name the vertex.

a. $y = x^2 - 10x + 27$

$a = 1 \quad b = -10 \quad c = 27$

$x = \frac{-b}{2a} = \frac{-(-10)}{2(1)}$

$x = 5$

$f(5) = (5)^2 - 10(5) + 27$

$f(5) = 2$

Form: $y = (x-5)^2 + 2$

Vertex: $(5, 2)$

b. $y = -x^2 + 6x - 8$

Form: _____

Vertex: _____

c. $y = -2x^2 - 24x - 75$

Form: _____

Vertex: _____

Intercept to Vertex

Directions: Convert from intercept form to vertex form. Then name the vertex.

a. $y = (x - 6)(x - 2)$

b. $y = -(x - 5)(x - 3)$

c. $y = \frac{1}{2}(x - 2)(x + 6)$

X-int: 2, −6

$x = \frac{2 + (-6)}{2} = -2$

$f(-2) = \frac{1}{2}(-2-2)(-2+6)$

$f(-2) = -8$

$y = \frac{1}{2}(x+2)^2 - 8$

Form: _____

Vertex: _____

Form: _____

Vertex: _____

Form: _____

Vertex: (−2, −8)

Unit 3B Quiz - Graphing Quadratic Functions 3/7/18

- Answer all 8 questions.
- Show all work to earn full credit!
- Do your very best; you can do this!!!