

Name:

Date:

Topic: **Vertex Form**

Class/Period:

Questions/Main Ideas:

Notes:

Vocabulary:  
Vertex Form

You have graphed quadratic function in standard form  $ax^2 + bx + c$

Quadratic functions can also be written in vertex form.

In this form, the vertex of the graph can be easily found.

**VERTEX FORM**

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

- The vertex:  $(h, k)$
- Axis of symmetry is  $x = h$
- The graph opens up if  $a > 0$
- The graph opens down if  $a < 0$

Step 1: Identify the values of  $a, h, k$ .

Graph the quadratic function in vertex form:  $y = -(x+2)^2 + 3$

$a = -1$     Vertex  $(h, k)$   
 $h = -2$      $(-2, 3)$   
 $k = 3$     AOS:  $x = -2$

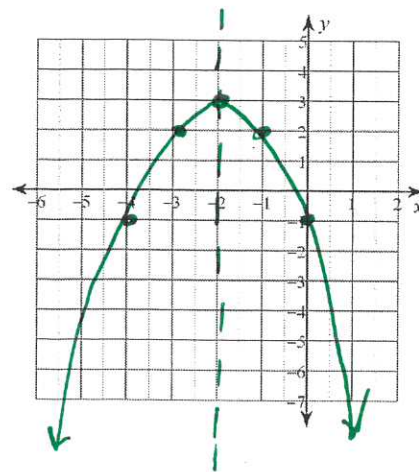
Step 2: Draw the axis of symmetry.  $x =$

Step 3: Plot the vertex  $(h, k)$

Step 4: Plot four points: 2 less than the vertex and two greater than the vertex

Step 5: Draw the parabola through the plotted points.

$x$	$-(x+2)^2 + 3$	$y$
-4	$-(-4+2)^2 + 3$ $-4 + 3$	-1
-3	$-(-3+2)^2 + 3$ $-1 + 3$	2
-2		3
-1	$-(-1+2)^2 + 3$ $-1 + 3$	2
0	$-(0+2)^2 + 3$ $-4 + 3$	-1

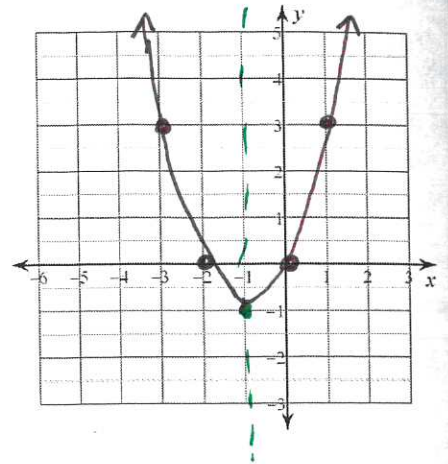


Graph the function in vertex form  $y = (x + 1)^2 - 1$

vertex  $(-1, -1)$

AOS:  $-1$

-3	$(-3+1)^2 - 1 = 4 - 1$	3
-2	$(-2+1)^2 - 1$ $1 - 1$	0
-1		-1
0	$(0+1)^2 - 1 = 1 - 1$	0
1	$(1+1)^2 - 1$ $4 - 1$	3



Write the function in Vertex Form and Graph  $y = x^2 - 8x + 11$   
 $a$   $b$   $c$

What is the equation for vertex form?

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

What do we need?

1) Vertex

What do we already know?

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

Find the vertex:

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

vertex  $(h, k)$   
 $(4, -5)$

$$y = 4^2 - 8(4) + 11$$

$$y = 16 - 32 + 11$$

$$y = -5$$

$$y = 1(x-4)^2 - 5$$