

Warm Up:
Identify the key features of graph A and B.
(AOS, vertex, y-int., x-int., domain & range)

Function A

$$y = -x^2 - 8x - 13$$

$a = -1, b = -8, c = -13$
 $x = \frac{-b}{2a} = \frac{+8}{-2} = -4$
 $y = (-4)^2 - 8(-4) - 13 = 16 + 32 - 13 = 35$
 $x\text{-int: } -5, -3$
 $y\text{-int: } -13$
 $D = (-\infty, \infty)$
 $R = (-\infty, 35]$

Function B

$$y = x^2 - 2x - 3$$

$a = 1, b = -2, c = -3$
 $x = \frac{-b}{2a} = \frac{+2}{2} = 1$
 $y = (1)^2 - 2(1) - 3 = 1 - 2 - 3 = -4$
 $x\text{-int: } -1, 3$
 $y\text{-int: } -3$
 $D = (-\infty, \infty)$
 $R = [-4, \infty)$

Sep 2-12:19 PM

Vertex Form

Sep 30-8:20 AM

Review: $y = ax^2 + bx + c$
 $y = -x^2 + 5$
 $a = -1, b = 0, c = 5$
 $x = \frac{-b}{2a} = \frac{0}{-2} = 0$
 $y = (0)^2 - 1(0) + 5 = 5$
 $x\text{-int: } -2, 2$
 $y\text{-int: } 5$
 $D = (-\infty, \infty)$
 $R = (-\infty, 5]$
 $y\text{-int: } 5$

Vertex, AOS, Max/Min, Domain/Range, Y-Int.

Sep 30-8:37 AM

Vertex Form
 $y = a(x - h)^2 + k$
 $v(h, k)$
 $a.o.s. x = h$
 axis of symmetry

Sep 30-9:09 AM

Graphing in vertex form

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

$a = 2, b = -16, c = 55$
 $x = \frac{-b}{2a} = \frac{+16}{4} = 4$
 $y = 2(4 - 4)^2 + 3 = 3$
 $x\text{-int: } 2, 6$
 $y\text{-int: } 35$
 $D = (-\infty, \infty)$
 $R = [3, \infty)$

Vertex, AOS, Max/Min, Domain/Range

Sep 30-9:11 AM

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

$a = \frac{1}{2}, b = 4, c = 10$
 $x = \frac{-b}{2a} = \frac{-4}{1} = -4$
 $y = \frac{1}{2}(-4 + 4)^2 - 2 = -2$
 $x\text{-int: } -6, -2$
 $y\text{-int: } -2$
 $D = (-\infty, \infty)$
 $R = [-2, \infty)$

Vertex, AOS, Max/Min, Domain/Range Zeros?

Sep 30-9:09 AM

Write the equation in vertex form given the vertex and a point.

a. Vertex (0, 1) Point (-3, 10)

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

$$10 = a(-3-0)^2 + 1$$

$$10 = 9a + 1$$

$$9 = 9a$$

$$1 = a$$

$$y = 1(x-0)^2 + 1$$

$$y = x^2 + 1$$

b. Vertex (0, 1) Point (-1, 6)

c. Vertex (0, 1) Point (2, -1)

Sep 12-8:29 AM

② v: $(-5, 4)$ point $(-2, -14)$

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

$$-14 = a(-2+5)^2 + 4$$

$$-14 = a(3)^2 + 4$$

$$-14 = 9a + 4$$

$$-18 = 9a$$

$$-2 = a$$

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

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

Oct 4-8:39 AM

Convert between standard form
and vertex form.

Hint: Find a, h, and k.

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

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

Ex 1) $y = x^2 + 4x - 7$ $a=1$ $h=-2$ $k=-11$

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

$$v: (-2, -11)$$

$$y = (x+2)^2 - 11$$

Jul 23-2:45 PM

+ 2 Ex $a=2$ $b=12$ $c=-5$

$$y = 2x^2 + 12x - 5$$

a.o.s. $x = -\frac{b}{2a} = -\frac{12}{2(2)} = -3$

$$v: (-3, -23)$$

$$y = 2(x+3)^2 - 23$$

Feb 5-11:08 AM

Convert between vertex form and
standard form
 $y = ax^2 + bx + c$

Ex 1) $y = 2(x-11)^2 + 5$

$$y = 2(x-11)(x-11) + 5$$

$$y = 2(x^2 - 11x - 11x + 121) + 5$$

$$y = 2(x^2 - 22x + 121) + 5$$

$$y = 2x^2 - 44x + 242 + 5$$

$$y = 2x^2 - 44x + 247$$

Feb 5-11:09 AM

Ex 2) $f(x) = -5(x+2)^2 - 1$

$$f(x) = -5(x+2)(x+2) - 1$$

$$f(x) = -5(x^2 + 4x + 4) - 1$$

$$f(x) = -5x^2 - 20x - 20 - 1$$

$$f(x) = -5x^2 - 20x - 21$$

Feb 5-11:10 AM

Now, It is your
Turn. Try in your
own.

Oct 4-7:35 AM