

What you will learn about:  
Writing Equations of Quadratics

Standard Form

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

Intercept Form

$$y = a(x - p)(x - q)$$

Vertex Form

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

Write the equation in standard form.

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

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

$$(x^2 + 2x + 1) - 4$$

$$x^2 + 2x - 3$$

$$g(x) = (x - 2)^2 + 6$$

$$(x-2)(x-2) + 6$$

$$x^2 - 4x + 4 + 6$$

$$x^2 - 4x + 10$$

$$f(x) = 2(x + 3)^2 - 2$$

$$2(x+3)(x+3) - 2$$

$$2(x^2 + 6x + 9) - 2$$

$$2x^2 + 12x + 18 - 2$$

$$2x^2 + 12x + 16$$

$$g(x) = -(x + 2)^2 + 1$$

$$-(x+2)(x+2) + 1$$

$$-(x^2 + 4x + 4) + 1$$

$$-x^2 - 4x - 4 + 1$$

$$-x^2 - 4x - 3$$

Write each equation in vertex form

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

$$f(x) + 2 = x^2 + 6x + 9 + 9$$

$$f(x) + 11 = (x + 3)^2$$

$$f(x) = (x + 3)^2 - 11$$

$$g(x) = 3x^2 - 12x - 10$$

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

$$g(2) = 3(2)^2 - 12(2) - 10$$

$$3(4) - 24 - 10$$

$$12 - 24 - 10$$

$$-22 \quad (2, -22)$$

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

$$= 3(x - 2)^2 - 22$$

$$\frac{-6}{2(1)} = -3$$

$$(-3)^2 + 6(-3) - 2$$

$$9 - 18 - 2$$

$$-11$$

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

Step #1 Find Vertex

Step #2 Find a point on the curve

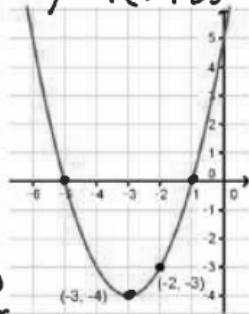
Step #3 Plug in h, k, x, and y solve for a

Step #4 Write equation with a, h, & k only

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

Write the equation of the function from the graph.

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

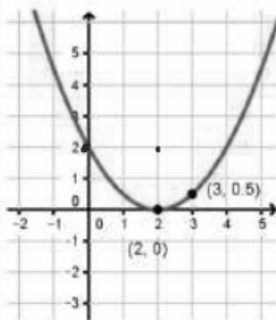


$(-3, -4)$	$(-2, -3)$
h k	x y

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

$$-3 = a - 4$$

$$a = 1$$



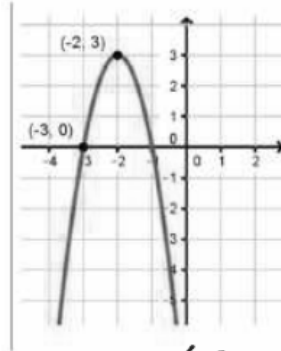
$(2, 0)$	$(3, 0.5)$
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$$2 = a(0-2)^2 + 0$$

$$2 = 4a + 0$$

$$\frac{2}{4} = \frac{4a}{4}$$

$$a = \frac{1}{2}$$

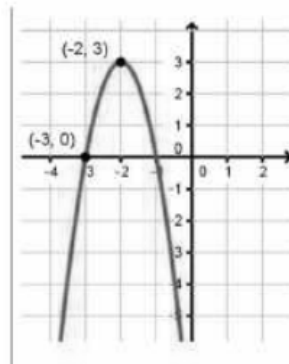


$$0 = a(-3+2)^2 + 3$$

$$0 = a + 3$$

$$a = -3$$

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



$$y = a(x+3)(x+1)$$

$$3 = a(-2+3)(-2+1)$$

$$3 = a(1)(-1)$$

$$3 = -a$$

$$a = -3$$

$$y = -3(x+3)(x+1)$$

h	k
$(-2, 3)$	
$(-3, 0)$	
x	y

$$a(-3+2)^2$$

$$a(-1)^2$$