

Write the 3 forms of a quadratic and what can be found easily from each form.

Standard Form

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

Y-intercept

$$(0, c)$$

Intercept Form

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

X-intercepts

$$(p, 0) \quad (q, 0)$$

Vertex Form

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

Vertex

$$(h, k)$$

Find the x-intercepts and find the vertex for each equation.

$$3\frac{1}{2} = \frac{7}{2}$$

$$y = (x - 4)(x + 8)$$

$$x - 4 = 0 \quad x + 8 = 0$$

$$x = 4 \quad x = -8$$

$$x = -2$$

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

$$(-6)(6)$$

$$V(-2, -36)$$

$$y = -2(x - 5)(x + 3)$$

$$x - 5 = 0 \quad x + 3 = 0$$

$$x = 5 \quad x = -3$$

$$x = 1$$

$$-2(1 - 5)(1 + 3)$$

$$-2(-4)(4)$$

$$V(1, 32)$$

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

$$x + 2 = 0 \quad x - 5 = 0$$

$$x = -2 \quad x = 5$$

$$x = 1.5$$

$$y = (1.5 + 2)(1.5 - 5)$$

$$(3.5)(-3.5)$$

$$\left(\frac{7}{4}\right)\left(-\frac{7}{4}\right) = -\frac{49}{16}$$

$$\left(\frac{3}{2}, -\frac{49}{16}\right)$$

Find the vertex of each equation and find the y-intercept.

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

$$V(-2, -3)$$

$$\text{Let } x=0$$

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

$$(0, 1)$$

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

$$V(4, 1)$$

$$\text{Let } x=0$$

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

$$(0, -47)$$

$$y = 5(x + 1)^2 - 6$$

$$V(-1, -6)$$

$$\text{Let } x=0$$

$$5(0+1)^2 - 6$$

$$(0, -1)$$

Consider the function $f(x) = -(x - 1)(x + 7)$. Find the key components to graph the function. Show your work and/or explain how to get the solution.

Opening Direction

Opens Down
a value is negative

X-intercepts

$$x-1=0 \quad x+7=0$$

$$x=1 \quad x=-7$$

Y-intercept

$$\text{let } x=0$$

$$-(0-1)(0+7)$$

$$-(-1)(7)$$

$$(0,7)$$

Vertex and Line of Symmetry

$$y = -(-3-1)(-3+7)$$
$$-(-4)(4)$$

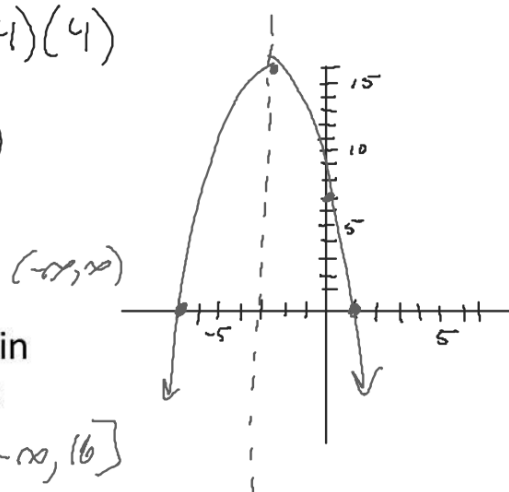
$$(-3, 16)$$

$$\text{A.O.S } x = -3$$

Domain

Range

$$(-\infty, 16]$$



Consider the function $f(x) = 2(x + 2)^2 + 3$. Find the key components to graph the function. Show your work and/or explain how to get the solution.

Opening Direction

opens up
a value is positive

Y-intercept

$$\begin{aligned} \text{let } x &= 0 \\ y &= 2(0+2)^2 + 3 \\ &= 2(4) + 3 \\ &= 11 \\ &(0, 11) \end{aligned}$$

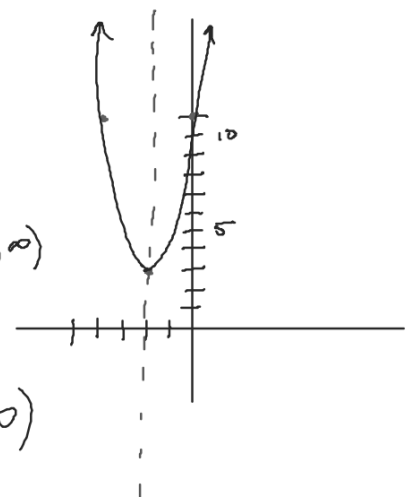
Vertex and Line of Symmetry

$$V(-2, 3) \quad \text{A.o.s. } x = -2$$

Domain

Range

$$(-\infty, \infty)$$
$$[3, \infty)$$



Write each equation in standard form.

$$y = (3x + 1)(2x - 5)$$

$$6x^2 - 15x + 2x - 5$$

$$y = 6x^2 - 13x - 5$$

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

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

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

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

$$y = -4(x + 2)^2 + 7$$

$$-4(x+2)(x+2) + 7$$

$$-4(x^2 + 4x + 4) + 7$$

$$-4x^2 - 16x - 16 + 7$$

$$-4x^2 - 16x - 9$$

$$y = 2(x - 3)^2 + 5$$

Describe the transformation

$$y = -\frac{1}{4}(x + 2)^2 + 5$$

$$y = 5(x - 6)^2 - 4$$