AA PREP—GRAPHING QUADRATIC FUNCTIONS IN STANDARD FORM—WORKSHEET #1 KEY

For each quadratic function, identify the vertex, axis of symmetry, x-intercepts, and y-intercepts. Graph!

1. $y = x^2 - 4x - 5$

$y = ax^2 + bx + c$

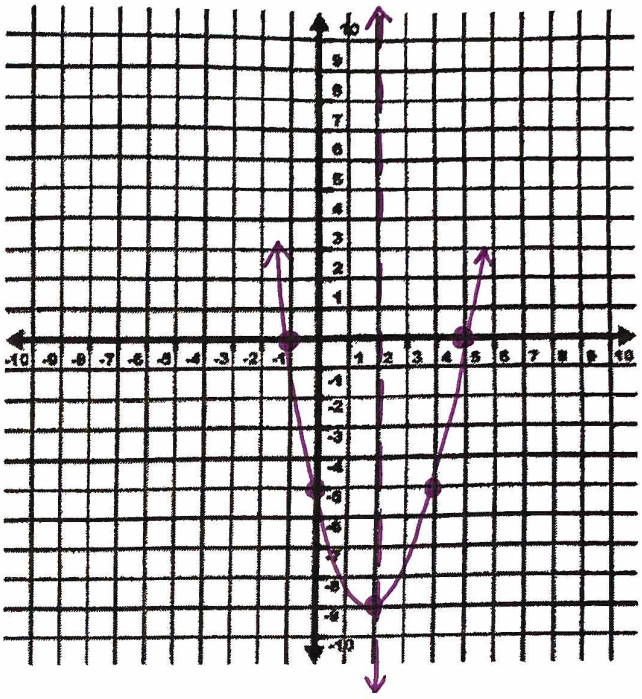
Vertex: $(2, -9)$

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

$y = (2)^2 - 4(2) - 5 = 4 - 8 - 5 = -9$

Axis of Symmetry: $x = 2$

$x = \frac{-b}{2a}$ ← SAME AS X-COORDINATE OF VERTEX



X-Intercepts: $(-1, 0)$ AND $(5, 0)$

$y = 0$ $\quad 0 = x^2 - 4x - 5$

$0 = (x+1)(x-5)$

$x = -1 \quad x = 5$

Y-Intercept: $(0, -5)$

$x = 0$ $\quad y = (0)^2 - 4(0) - 5 = -5$

$y = -5$

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

$y = ax^2 + bx + c$

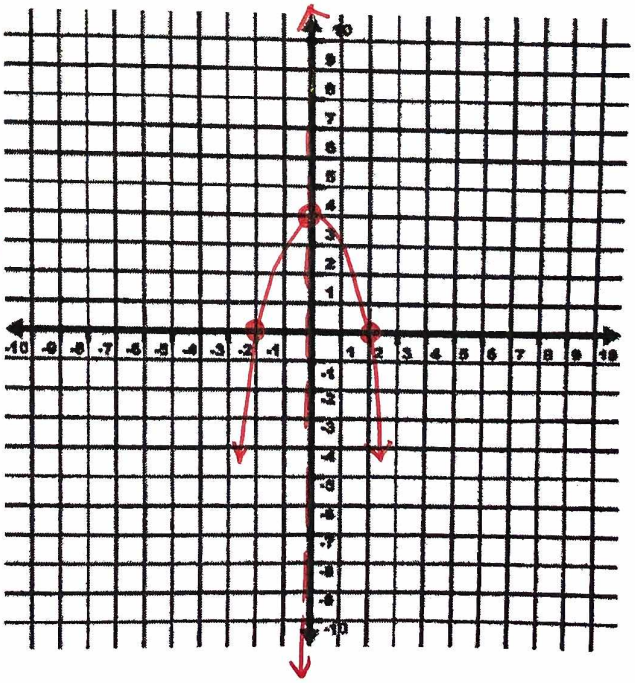
Vertex: $(0, 4)$

$x = \frac{-b}{2a} = \frac{-0}{2(-1)} = \frac{0}{-2} = 0$

$y = -(0)^2 + 4 = 4$

Axis of Symmetry: $x = 0$

$x = \frac{-b}{2a}$ ← SAME AS X-COORDINATE OF VERTEX



X-Intercepts: $(2, 0)$ AND $(-2, 0)$

$y = 0$ $\quad 0 = -x^2 + 4$

$0 = -(x^2 - 4)$

$0 = -(x-2)(x+2)$

$x = 2 \quad x = -2$

Y-Intercept: $(0, 4)$

$x = 0$ $\quad y = -(0)^2 + 4 = 4$

$y = 4$

3. $y = x^2 + 6x$

$y = ax^2 + bx + c$

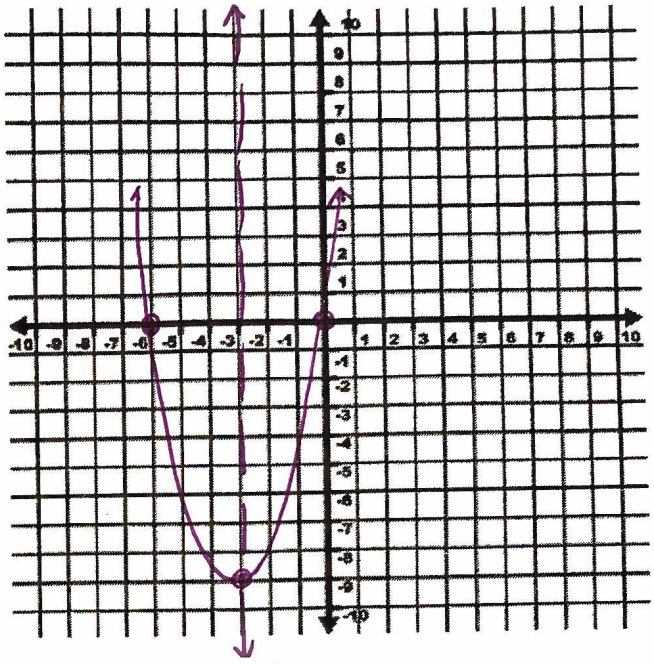
Vertex: $(-3, -9)$

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

$y = (-3)^2 + 6(-3) = 9 - 18 = -9$

Axis of Symmetry: $x = -3$

$x = \frac{-b}{2a}$ ← SAME AS X-COORD. OF VERTEX



X-Intercepts: $(0, 0)$ AND $(-6, 0)$

$y = 0$ $\quad 0 = x^2 + 6x$

$0 = x(x + 6)$

$x = 0$ $\quad x = -6$

Y-Intercept: $(0, 0)$

$x = 0$ $\quad y = (0)^2 + 6(0) = 0$

$y = 0$

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

$y = ax^2 + bx + c$

Vertex: $\left(\frac{-3}{2}, \frac{-25}{4}\right)$ OR $\left(-1\frac{1}{2}, -6\frac{1}{4}\right)$

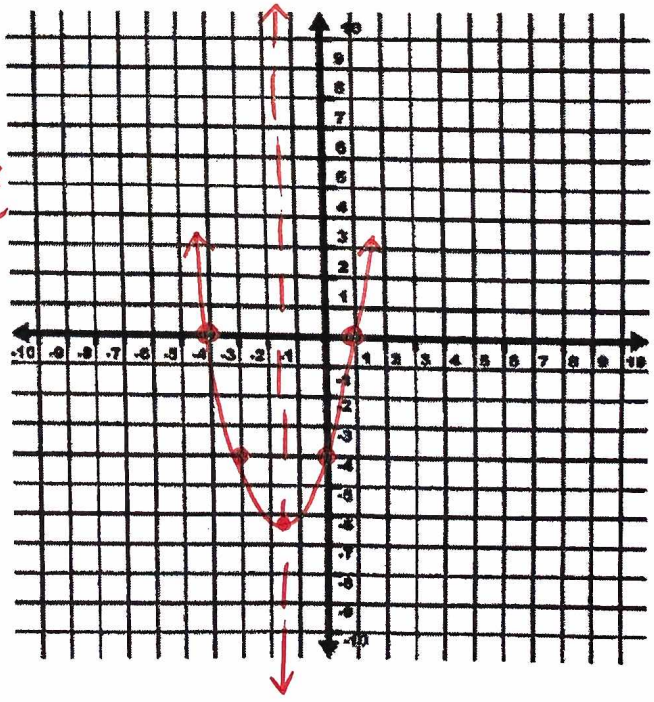
$x = \frac{-b}{2a} = \frac{-3}{2(1)} = \frac{-3}{2}$

$y = \left(\frac{-3}{2}\right)^2 + 3\left(\frac{-3}{2}\right) - 4 = \frac{9}{4} - \frac{9}{2}\left(\frac{2}{2}\right) - 4\left(\frac{4}{4}\right)$

$\frac{9}{4} - \frac{18}{4} - \frac{16}{4} = \frac{-25}{4}$

Axis of Symmetry: $x = -\frac{3}{2}$

$x = \frac{-b}{2a}$ ← SAME AS X-COORD. OF VERTEX.



X-Intercepts: $(-4, 0)$ AND $(1, 0)$

$y = 0$ $\quad 0 = x^2 + 3x - 4$

$0 = (x + 4)(x - 1)$

$x = -4$ $\quad x = 1$

Y-Intercept: $(0, -4)$

$x = 0$ $\quad y = (0)^2 + 3(0) - 4 = -4$

$y = -4$