

9-2

Practice

Form K

Quadratic Functions

For each equation, find the axis of symmetry and the coordinates of the vertex.

1. $y = 3x^2 + 1$ $a=3; b=0, c=1$

Axis of symmetry: $x = -\frac{b}{2a}$

$x = \frac{-0}{2(3)}$

$x = 0$

Vertex:

$(0, 1)$

$y = 3(0)^2 + 1$

$y = 3(0) + 1$

$y = 1$

2. $y = x^2 - 6x + 2$ $a=1; b=-6, c=2$

Axis of symmetry: $x = -\frac{b}{2a}$

$x = \frac{6}{2(1)}$

$x = 3$

Vertex:

$(3, -7)$

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

$y = 9 - 18 + 2$

$y = -9 + 2$

$y = -7$

3. $y = 3x^2 + 6x - 8$

$a=3$
 $b=6$
 $c=-8$

Axis of symmetry:

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

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

$x = -1$

Vertex:

$(-1, -11)$

$y = 3(-1)^2 + 6(-1) - 8$

$y = 3 - 6 - 8$

$y = -3 - 8$

$y = -11$

4. $y = -6x^2 + 12x - 3$

$a=-6$
 $b=12$
 $c=-3$

Axis of symmetry:

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

$x = \frac{-12}{2(-6)}$

$x = 1$

Vertex:

$(1, 3)$

$y = -6(1)^2 + 12(1) - 3$

$y = -6 + 12 - 3$

$y = 6 - 3$

$y = 3$

5. Graph $y = 4x^2 - 8x + 1$ without using a table. Label the axis of symmetry and the vertex.

$a = 4$, $b = -8$, $c = 1$

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

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

$x = 1$

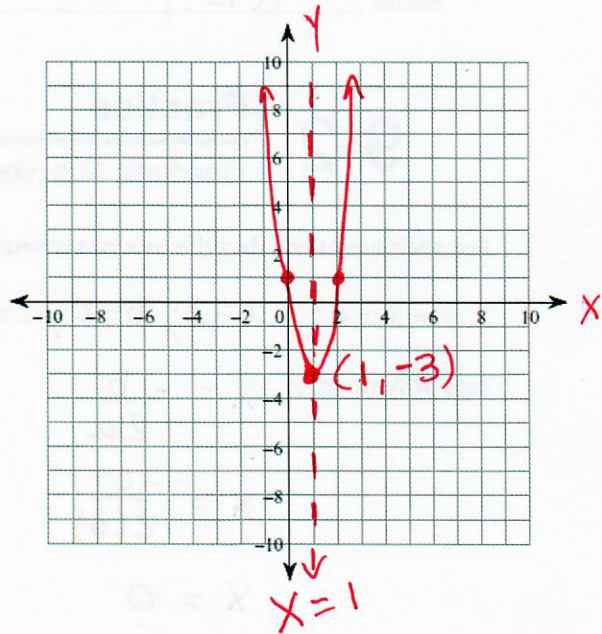
Vertex: $(1, -3)$

$y = 4(1)^2 - 8(1) + 1$

$y = 4 - 8 + 1$

$y = -3$

y-intercept: $(0, c) \Rightarrow (0, 1)$



6. A golf ball is chipped into the air from a small hill with an upward velocity of 50 ft/sec. Its height h in feet after t seconds is given by the function $h = -16t^2 + 50t + 10$.



switch a & b

a. What is the maximum height the ball reaches? Time
(Hint: think about what part of the graph is represented when the ball reaches the max height)

$a = -16$
 $b = 50$
 $c = 10$

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

$t = \frac{-50}{2(-16)}$

$t = \frac{-50}{-32}$ or $\frac{25}{16}$ or 1.56 sec.

b. How long will it take the ball to reach the maximum height? Height

$h = (-16)\left(\frac{25}{16}\right)^2 + 50\left(\frac{25}{16}\right) + 10$

$h = -1.5625 + 78.125 + 10$

$h = 86.56$ ft

c. How long does it take the ball to hit the ground?

$(1.56)(2) = 3.12$ seconds

