Lesson 9-3

Objective - To graph quadratic functions using critical features of quadratics.

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

$y = ax^2 + bx + c$

Axis

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

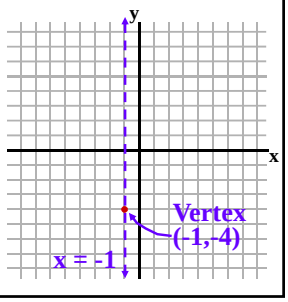
$x = -1$

Vertex $(-1, y)$

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

$y = 1 - 2 - 3$

$y = -4$ $(-1, -4)$



Objective - To graph quadratic functions using critical features of quadratics.

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

$y = ax^2 + bx + c$

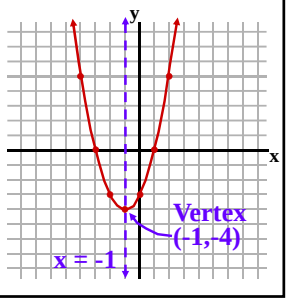
y-intercept

$c = -3$

$y - int. = -3$

Other Points

x	y
1	$(1)^2 + 2(1) - 3 = 0$
2	$(2)^2 + 2(2) - 3 = 5$
3	$(3)^2 + 2(3) - 3 = 12$



Find the critical features of $y = -x^2 + 2x + 8$ algebraically, then graph the quadratic.

Axis

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

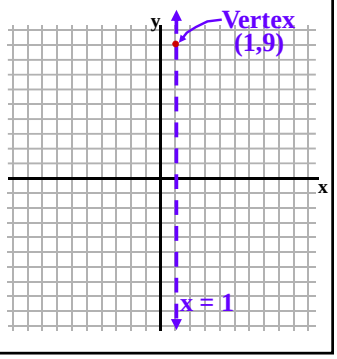
$x = 1$

Vertex $(1, y)$

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

$y = -1 + 2 + 8$

$y = 9$ $(1, 9)$



Graph $y = -x^2 + 2x + 8$ and then find the critical features of the quadratic algebraically.

Opens Up/ Down?

$a = -1$

Opens Down

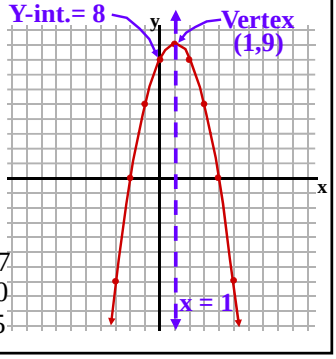
y-intercept

$c = 8$

$y - int. = 8$

Other Points

x	y
-3	$-(-3)^2 + 2(-3) + 8 = -7$
-2	$-(-2)^2 + 2(-2) + 8 = 0$
-1	$-(-1)^2 + 2(-1) + 8 = 5$



A golf ball follows a parabolic path when hit. Its height, h(x), over time in seconds, x, is represented by $h(x) = -x^2 + 8x$. Find the maximum height reached by the ball and its time in the air.

Axis

$x = \frac{-b}{2a} = \frac{-(8)}{2(-1)}$

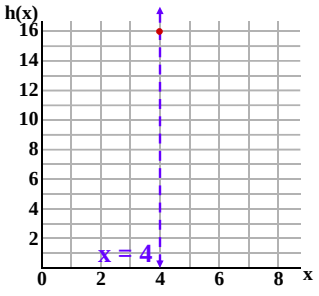
$x = 4$

Vertex $(4, y)$

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

$y = -16 + 32$

$y = 16$ $(4, 16)$



A golf ball follows a parabolic path when hit. Its height, h(x), over time in seconds, x, is represented by $h(x) = -x^2 + 8x$. Find the maximum height reached by the ball and its time in the air.

y-intercept

$c = 0$

$y - int. = 0$

Other Points

x	y
2	$-(2)^2 + 8(2) = 12$
6	$-(6)^2 + 8(6) = 12$
8	$-(8)^2 + 8(8) = 0$