Find the coordinates of the vertex and the equation of the LOS for each quadratic.

$y = ax^2 + c$

	Vertex	Eq of LOS
1. $y = -9x^2 + 2$ (2 up)	(0, 2)	$x = 0$
2. $y = 0.5x^2 - 7$	(0, -7)	$x = 0$

Graph each parabola using at least 5 points.

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

2. $y = 3x^2 - 9$

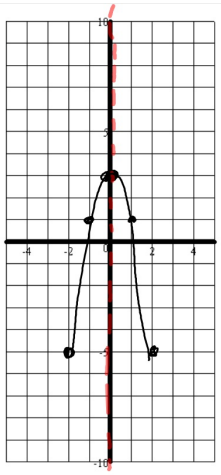
Graph this quadratic using at least 5 points.

$y = -2x^2 + 3$ (vertical stretch; 3 up)

Vertex (0, 3)

LOS: $x = 0$

x	y
1	1
2	-5



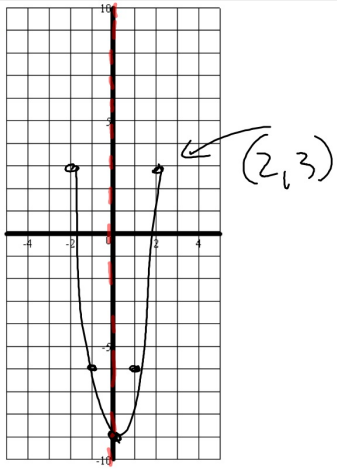
Graph this quadratic using at least 5 points.

$y = 3x^2 - 9$

x	y
1	-6
2	3

vertex (0, -9)

LOS: $x = 0$



You can now do Hwk #21

Use the sheet of paper I've already printed out.

Due tomorrow

$y = ax^2 + c$

a
- determines if parabola opens up or down
- determines if parabola is wide or narrow

c
- moves parabola up and down
- determines the location of the vertex
- y - int

Sec 10-2: Quadratic Functions

$y = ax^2 + bx + c$

b
- affects the location of the LOS

moves parabola Left & right

$y = ax^2 + bx + c$

b

Affects its Horizontal position:
It's used to locate the LOS

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

Find the equation for the Line of Symmetry for each quadratic.

1. $y = 3x^2 - 12x + 8$ $x = \frac{12}{2(3)} = \frac{12}{6} = 2$

2. $y = -x^2 - 10x - 3$ $x = \frac{10}{-2} = -5$ $10/(2*-1)$

3. $y = \frac{1}{2}x^2 + 5x - 7$ $x = \frac{-5}{1} = -5$

Now that you have found the LOS, find the coordinates of the Vertex.

1. $y = 3x^2 - 12x + 8$ LOS: x = 2

Vertex: (2, -4) $3(2)^2 - 12(2) + 8$

2. $y = -x^2 - 10x - 3$ LOS: x = -5

Vertex: (-5, 22) $-(-5)^2 - 10(-5) - 3$ $-25 + 50 - 3$

3. $y = \frac{1}{2}x^2 + 5x - 7$ LOS: x = -5

Vertex: (-5, -19.5) $\frac{1}{2}(-5)^2 + 5(-5) - 7$ $12.5 - 25 - 7$ $-12.5 - 7$

The y-intercept of a parabola:

Replace x with zero and solve for y.

Find the y-intercept of each parabola:

1. $y = 5x^2 + 2x - 11$ y-int = -11

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

Given a quadratic in Standard Form:

$y = ax^2 + bx + c$

What is the y-intercept? c

or $(0, c)$

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

- Find the LOS $-b/2a$
- Find the Vertex
- Find the y-intercept
- Reflect y-intercept over the LOS
- Use a table to find other point(s) and reflect over the LOS

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

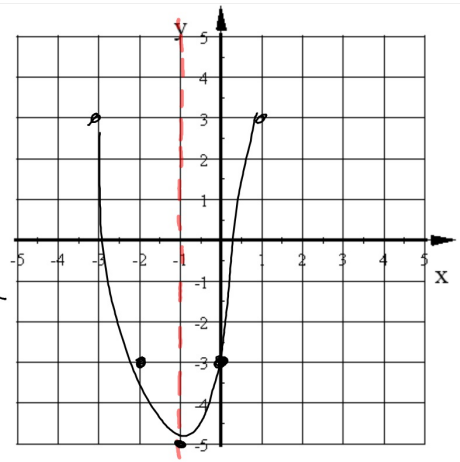
y-int = -3

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

Vertex $(-1, -5)$

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

x	y
1	3



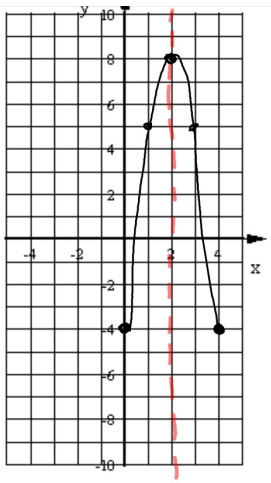
Graph $y = -3x^2 + 12x - 4$

y-int $= -4$

LOS: $x = \frac{-12}{-6} = 2$

Vertex $(2, 8)$

x	y
1	5



The vertex of a parabola is either the Maximum or the Minimum of the function.

A ball is shot into the air from the top of a 20 foot building with an initial velocity of 112 ft/sec. The following equation models the height of the ball as a function of time:

$$h(t) = -16t^2 + 112t + 20$$

a

LOS $t = \frac{-112}{-32}$

$= 3.5$ sec

$h(3.5) = 216$

$$h(t) = -16t^2 + 112t + 20$$

Find the time it takes to get to the maximum height.

LOS: t = 3.5 sec

Find the ball's maximum height. h(3.5) = 216 feet

A company wants to minimize its costs. The following equation gives the company's costs as a function of the number of employees:

$$C(e) = 12e^2 - 360e + 2850$$

y x

1. How many employees should the company have in order to minimize its costs?

15 employees

2. What are the minimum costs? $150