1. State if each parabola opens up or down.

ax^2+bx+c

a) $y = -805x^2 + 9x - 7$ NEG D ∩

b) $y = 4x - x^2 + 3$ $-x^2+4x+3$ D

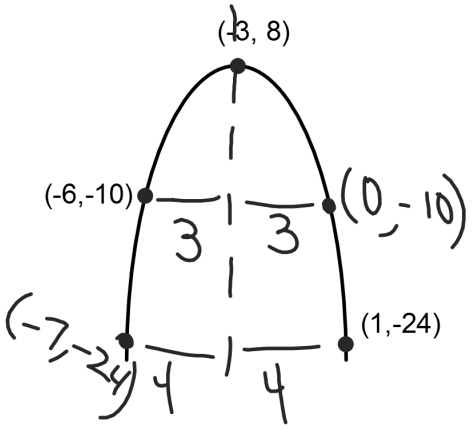
c) $y = 0.0013x^2 - 29x - 108$ POS Neg. ∪

2. The LOS of the quadratic equation $y = -3x^2 - 12x + 7$ is $x = -2$.

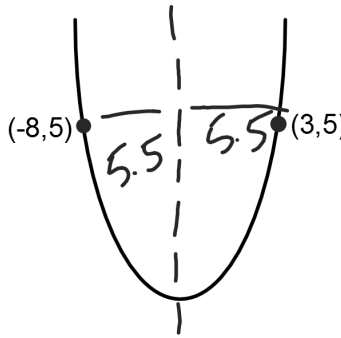
State the coordinates of the vertex. $-3(-2)^2-12(-2)+7$

$(-2, 19)$

3. Find the coordinates of two other points on this parabola.



4. Write the equation of the LOS of this parabola.



$\frac{-8+3}{2}$

$x = -2.5$

4. Is the vertex of each parabola a Maximum or a Minimum?

a) $y = 3.07x^2 + 13x - 49$ min

b) $y = x^2 - 270x$ min

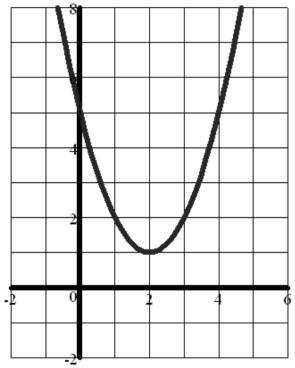
c) $y = -6x^2 + 97$ max

Section 10-1: Graphs of Quadratics

Standard Form of a Quadratic Function:

$y = ax^2 + bx + c$

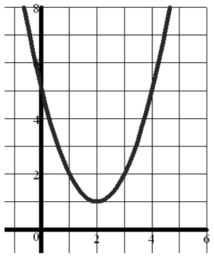
Graph of a quadratic equation is a Parabola



Vertex

Line of Symmetry LOS
Axis of Symmetry

Does this parabola open Up or Down?



Coordinates of the Vertex (2 , 1)

Eq for the LOS: $x = 2$

What is the relationship between the Line of Symmetry (LOS) and the vertex of a parabola? The Equation for the LOS and the x-coord of the vertex are ALWAYS the same

The vertex of a parabola is the point (-5, 8)

What is the equation for the LOS? $x = -5$

The quadratic $y = x^2 + 6x - 1$ $(-3)^2 + 6(-3) - 1$
has the following LOS: $x = -3$

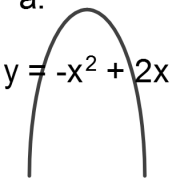
What are the coordinates of the vertex?

$(-3, -10)$

Tell if each parabola has a Maximum or a Minimum:

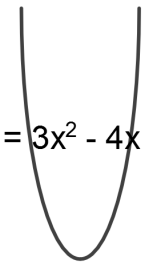
a. max

$y = -x^2 + 2x$



b. min

$y = 3x^2 - 4x - 1$



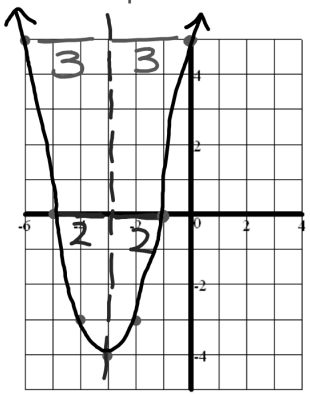
Match the equations below to the graphs above.

Given the quadratic $y = ax^2 + bx + c$

The parabola opens up if: $a > 0$

The parabola opens down if: $a < 0$

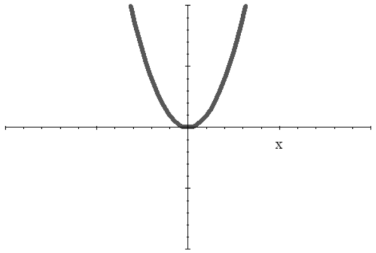
Given the following points of a parabola find 3 other points.



Using a graphing calculator graph the following in Y_1 using a standard window.

$Y_1 = x^2$

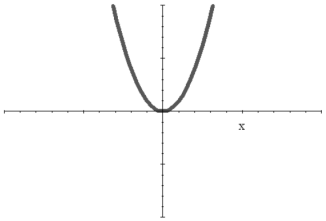
This is the Parent Quadratic Function where a = 1



Leave $Y_1 = x^2$

In Y_2 enter equations like this $Y_2 = ax^2$ using different positive values for a. Notice how the graph changes and make some conclusions about what the value of a does to the graph.

$Y = ax^2$
$a = 1$



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

What the coefficient a does to the graph of a parabola.

$a > 0$ parabola opens up

$a < 0$ parabola opens down

|a|

as |a| >1 the more narrow the parabola gets.

bigger is more narrow

as 0<|a| <1 the wider the parabola gets.

smaller is wider

Put these parabolas in order from widest to narrowest.

Widest $y = -0.14x^2 + 8x + 14$

$y = 0.2x^2 + 92$

$y = -1.3x^2 - 4x + 11$

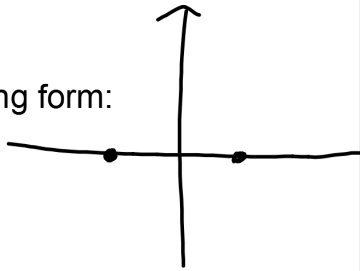
$y = 4x^2 - 27x - 100$

Narrowest $y = -6x^2 + x - 75$

Solving Quadratic Equations:

A Quadratic Equation has the following form:

$ax^2 + bx + c = 0$ This means y = 0

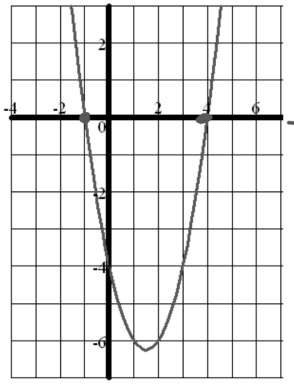


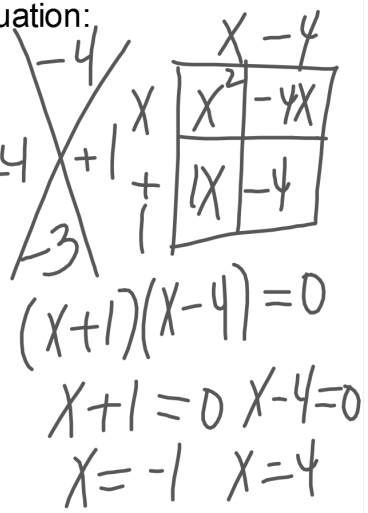
When y=0 the corresponding value of x is the x-intercept of the graph.

Use the graph below to solve this equation:

$x^2 - 3x - 4 = 0$

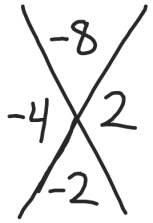
4
−1





Solve by factoring:

$x^2 - 2x - 8 = 0$



	x	-4
x	x^2	$-4x$
2	$2x$	-8

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

$x=4 \quad x=-2$

How do these solutions relate to the graph of $y = x^2 - 2x - 8$? X int.

Another technique to solve quadratic equations that can be used SOMETIMES is using Square Roots

Ex: Solve. $4x^2 - 25 = 0$

$(2x+5)(2x-5)=0$

$2x+5=0$

$2x=-5$

$x=\frac{-5}{2}, \frac{5}{2}$

Sec 10-2: Quadratic Functions

Standard Form of a Quadratic Function:

$y = ax^2 + bx + c$

a
- Determines if a parabola opens up or down
- Determines if a parabola is taller (narrower) or shorter (wider)

c
- Moves the parabola up or down (vertical translation)

(affecting the location of the vertex)

IXL #13 - AA.7 & BB.1 due today at 4pm!