

## 5.2 Graph Quadratic Functions in Standard Form

Standard Form:Properties of Quadratics in Standard Form:If  $a > 0$ :If  $a < 0$ :

The y-intercept is:

If  $|a| > 1$ :If  $|a| < 1$ :

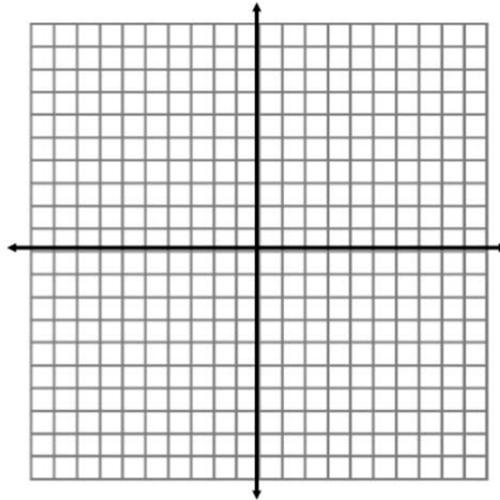
Axis of Symmetry:

Vertex:

Ex 1 Graph:

Axis of Symmetry:

Vertex:

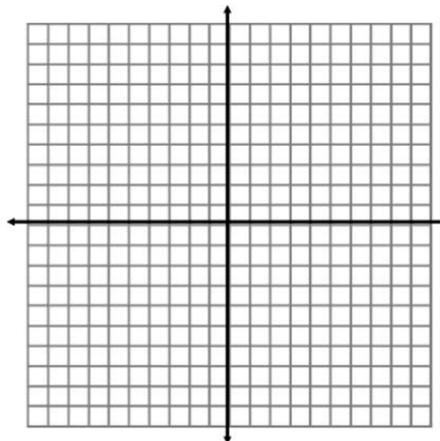


x	f(x)

1-3-5 Graphing Shortcut

Ex. 2:  $f(x) = x^2 + 4x - 3$

Ex 3:  $f(x) = \frac{1}{2}x^2 + 2x - 3$



Ex 4: Tell whether the quadratic has a minimum, or maximum value. Then find that value.

$$f(x) = \frac{3}{2}x^2 + 6x + 4$$

Write the quadratic equation in standard form.

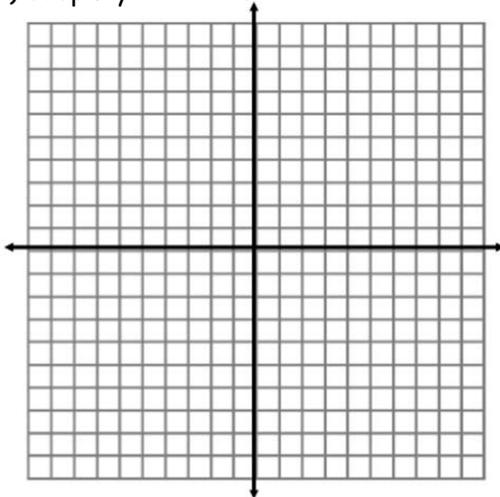
Ex 5:  $f(x) = (x + 2)^2 - 4$

Ex 6:  $y = -3(x-1)^2 + 4$

Ex 7: Super Kelly is just a newbie with his super powers. He's still at the "able to leap tall buildings in a single bound" stage. He jumped one building and then wanted to find out how high he jumped. He figured out the equation of his jump to be  $f(x) = -x^2 + 200x - 8500$ . How high did he jump?

You try!

1) Graph:  $y = -2x^2 - 8x + 2$



2) Tell whether the quadratic has a minimum, or maximum value. Then find that value.

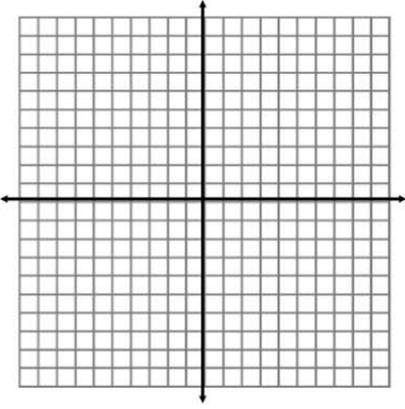
$$f(x) = -\frac{1}{4}x^2 - 7x + 2$$

Summarize your notes:

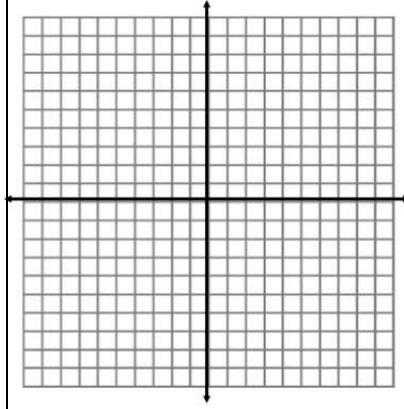
### 5.2 Practice Problems

Directions: Graph. Label the y-intercept, vertex and axis of symmetry. Graph with a table or using 1-3-5 shortcut.

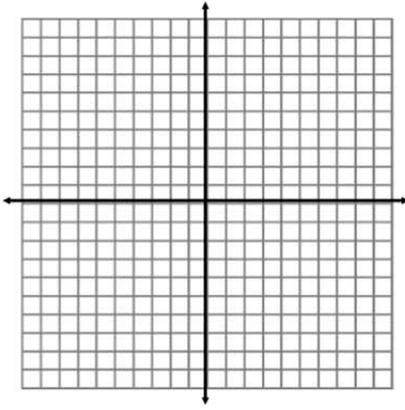
1)  $f(x) = -2x^2$



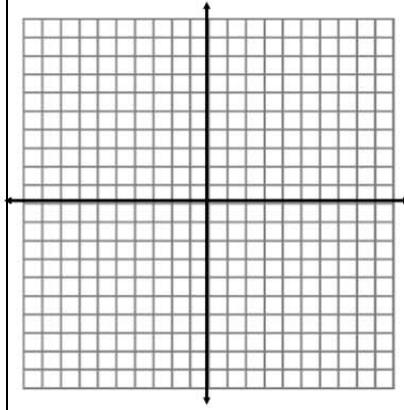
2)  $f(x) = x^2 - 3$



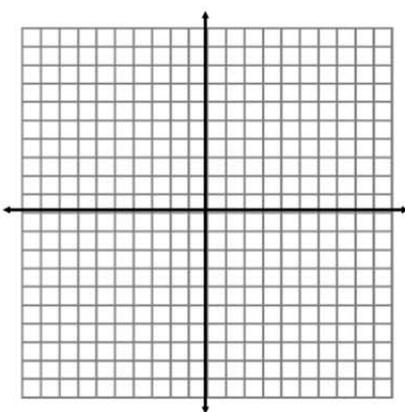
3)  $f(x) = -x^2 + 4x + 5$



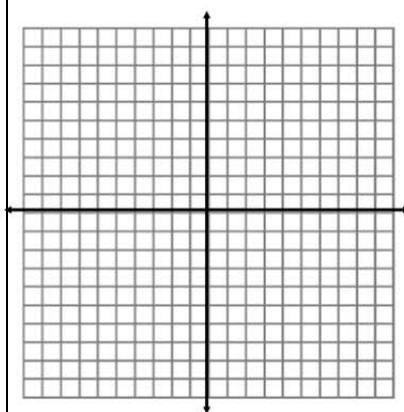
4)  $f(x) = x^2 + 6x$



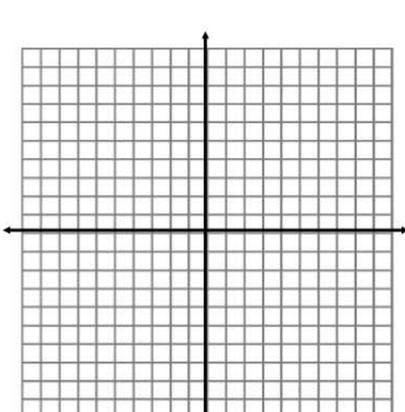
5)  $f(x) = 2x^2 - 4x - 7$



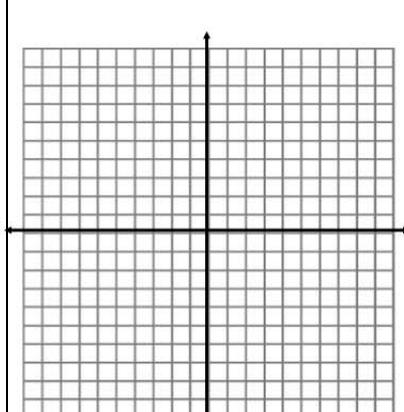
6)  $f(x) = \frac{1}{2}x^2 + 2x - 3$



7)  $f(x) = \frac{1}{2}x^2 + 4x + 2$



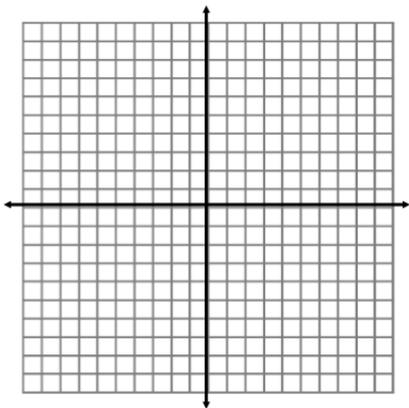
8)  $f(x) = -3x^2 - 6x + 5$



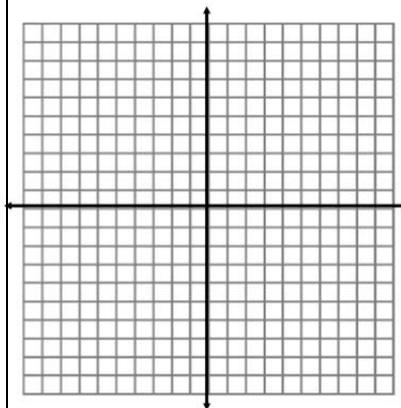
Plot as many points as possible, try for 5, but at least 3.

Plot as many points as possible, try for 5, but at least 3.

9)  $f(x) = x^2 - 8x + 6$



10)  $f(x) = 2x^2 + 8x - 1$



Directions: Tell whether each function has a minimum value or a maximum value. Find the minimum or maximum value.

11)  $y = -6x^2 - 1$

12)  $f(x) = 2x^2 + 8x + 7$

13)  $y = -3x^2 + 18x - 5$

Directions: Put the quadratic equation in standard form.

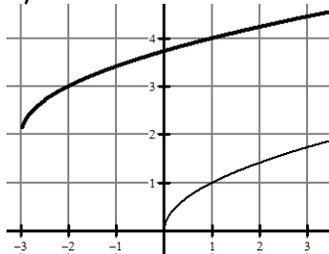
14)  $f(x) = -2(x - 1)^2 - 4$

15)  $f(x) = (x - 3)^2 + 2$

16)  $(x - 4)^2 - 5$

### Algebra Skillz

Below, the graph of  $f(x) = \sqrt{x+3} + 2$  is sketched in bold. Its parent function  $f(x) = \sqrt{x}$  is represented by the thin curve.



1) Describe the translation of the parent graph.

2) How does the translation relate to the equation?

3)  $2\sqrt{12} + 4\sqrt{27}$

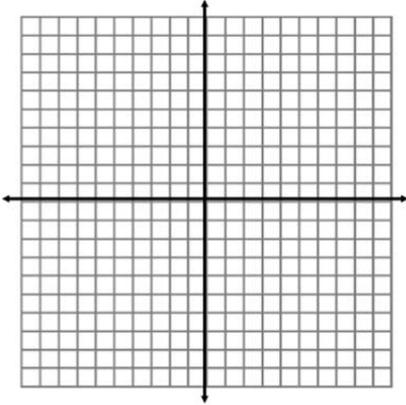
4)  $(13x - 10) + (2x^2 - 10x + 4)$

5) Multiply:  
 $(2x - 5)(4x + 15)$

6) Factor and solve.  
 $x^2 - 11x = 80$

## 5.2 Application and Extension

1) Graph the following:  $f(x) = -2x^2 - 4x + 6$



2) Tell whether there is a minimum value or maximum value. Then find the minimum or maximum value.

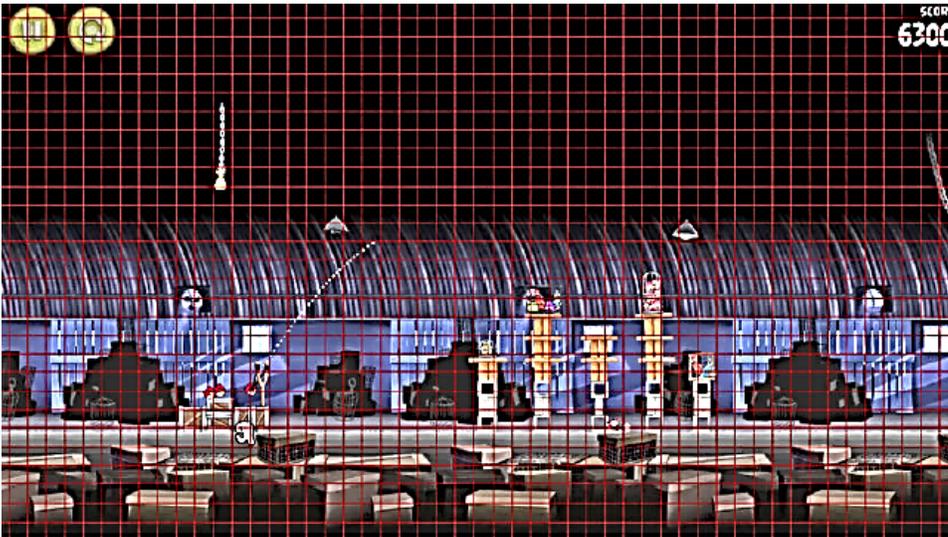
$$y = .2x^2 + 40.2x + 10$$

**AMAZINGLY RICH TASK!!!!!!!**

**Where Would the Angry Birds Land?**

The first thing that you **ABSOLUTELY, POSITIVELY, NO DOUBT, MUST DO** is watch the video that is posted in Section 5.2 under the notes. While you watch this video, think about this question: Where would each Angry Bird actually land if it didn't hit anything during flight? The original screenshots can also be found on that webpage if you need a better graphic.

**ANGRY BIRD #1:** Where would this bird land? Please remember to show your process and explain any mathematical thinking you do. Simply having an answer is not acceptable.



ANGRY BIRD #2: Where would this bird land? Please remember to show your process and explain any mathematical thinking you do. Simply having an answer is not acceptable.

