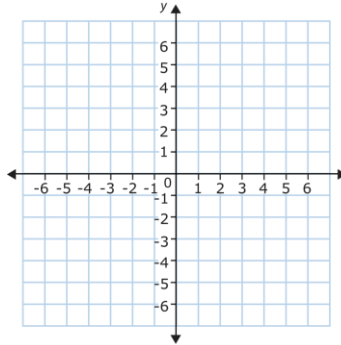


## Lesson 6-1 – Graphing Quadratic Functions

Fill in the t-chart for the following equation and graph.

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



vertex:

a.o.s.:

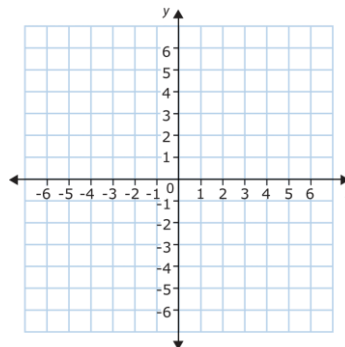
y-int:

x-int:

open up/down:

This figure is called a **parabola**. The minimum value, or the lowest point on the parabola above, is called the **vertex**. What is the vertex of the parabola above? A vertical line drawn through the vertex is called the **axis of symmetry** (a.o.s.). What is the axis of symmetry for the parabola above? The y-intercept is where it crosses the x-axis. Where does this happen? The x-intercept(s) is where it crosses the x-axis. Where does this happen?

Quadratic functions may take the form of  $y = ax^2 + bx + c$ . Make a table of values and graph the quadratic function  $y = -x^2 + 2x + 3$ .



vertex:

a.o.s.:

y-int:

x-int:

open up/down:

Is there a way to answer these questions without graphing? Yes!!!

vertex: the x-coordinate of the vertex is  $-\frac{b}{2a}$ . Once you find the x-coordinate, plug it into the function to get the y-coordinate.

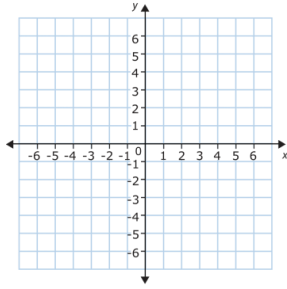
axis of symmetry:  $x = -\frac{b}{2a}$

y-intercept: plug in 0 for x (you should see that it is always "c")

open up/down: if "a" is positive, it opens up - if "a" is negative, it opens down

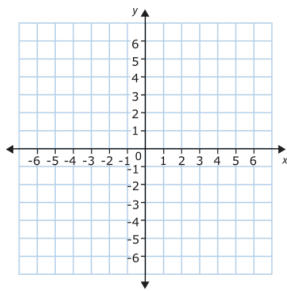
For each of the functions below, graph the function and answer the questions in the box.

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



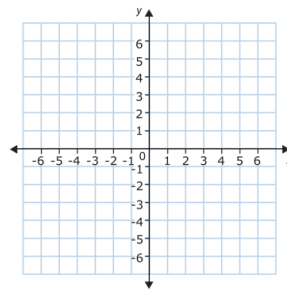
vertex:  
a.o.s.:  
y-int:  
x-int:  
open up/down:

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



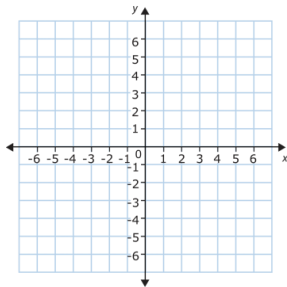
vertex:  
a.o.s.:  
y-int:  
x-int:  
open up/down:

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



vertex:  
a.o.s.:  
y-int:  
x-int:  
open up/down:

4.  $y = -x^2 + 9$



vertex:  
a.o.s.:  
y-int:  
x-int:  
open up/down: