Exploring quadratic functions (7.1)  
**Due: Wednesday Sept 26th**

1. Find and write the definition of a quadratic function in words you understand. (use your textbook, google, etc)

A, B, and C are numbers not equal to 0. The graph is called a parabola.

1. Give an example of a quadratic function and give an example of a function that is NOT a quadratic.

*y* = *x*2 – *x* – 12 GOOD

x (to the power of) 3 + 1 BAD

1. Go to desmos.com and type in the following function:
   1. Desmos will give you the option of adding “sliders” for or all. Click all. This will allow you to change the values of to see how the graph changes.
   2. Start with slider values . Describe any symmetry you notice.

The graph intercepts at 0. It spreads up and outwards.

1. Keep b = c = 0. Change the value of :
   * 1. Does the graph open up or open down? Up.
     2. Does the graph have a maximum point or minimum point? No.
     3. Does the graph open up or open down? Down.
     4. Does the graph have a maximum point or minimum point? No.
     5. Is the graph narrow or wide? Narrow.
   1. 1. Is the graph narrow or wide? wide.
2. We call the maximum or minimum point of a quadratic function the **vertex**. Complete the following statements:
   1. When is Pos (positive/negative), the vertex is a Max (maximum/minimum)
   2. When is Neg (positive/negative), the vertex is a Min (maximum/minimum)
3. Let and constant. Use the slider to change the value of Describe how the graph changes as changes.

The graph moves up and down along the Y axis.

**Roots** are the solutions to the quadratic equation.  The roots are found by looking at where the curve crosses the x axis (x-intercepts).

Adjust the sliders for a, b and c so you can get a curve that just touches the x axis (y=0).

              Equation: a= 0.7 b= -4 c= -2.7

This quadratic equation has ONE solution.

Adjust the sliders so you can get the roots of 0 and -1

              Equation:

This quadratic equation has TWO solutions.

Adjust the sliders so that the curve does NOT cross the x-axis.

              Equation:  a= 0.2 b= -1.5 c= 10

When the curve does NOT cross the x-axis, there are NO REAL solutions for this equation.