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: $y=ax^{2}+bx+c$
	1. Desmos will give you the option of adding “sliders” for $a, b, c$ or all. Click all. This will allow you to change the values of $a, b, c$ to see how the graph changes.
	2. Start with slider values $a=1, b=0, c=0$. Describe any symmetry you notice.

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

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