Exploring quadratic functions (7.1)

Follow the instructions laid out in this worksheet and post your answers in a blog post. Use [www.desmos.com](http://www.desmos.com) to answer the questions below.   
**Due: Wednesday Sept 26th**   
Title: Exploring quadratic functions  
Categorize: Math 11  
Tag: quadratics, pahlevanlu

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

* **Quadratic Function**: **A quadratic function is in the form of f(x) = ax2 + bx + c, where a**, **b**, **and c are numbers that are not equal to zero. When this type of equation is graphed on a coordinate plane it makes a U Shape called a parabola. Parabolas may open upward or downward and vary in "width" or "steepness", but they all have the same basic "U" shape.**

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

**Quadratic Function: Y= 10x2 + 15x + 2**

**NOT a Quadratic Function: Y= 9x-4**

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 bottom of the line starts at zero. Both sides of the parabola are equal and run through the exact same points.**

1. Keep b = c = 0. Change the value of :
   * 1. Does the graph open up or open down?

**The graph opened downwards.**

* + 1. Does the graph have a maximum point or minimum point?

**The maximum point would be zero.**

* + 1. Does the graph open up or open down?

**The graph opens upwards.**

* + 1. Does the graph have a maximum point or minimum point?

**The graph would have a minimum point which would be zero.**

* + 1. Is the graph narrow or wide?

**The graph is wide.**

* 1. 1. Is the graph narrow or wide?

**The graph is narrow.**

1. We call the maximum or minimum point of a quadratic function the **vertex**. Complete the following statements:
   1. When is **positive** (positive/negative), the vertex is a **minimum** (maximum/minimum)
   2. When is **negative** (positive/negative), the vertex is a **maximum** (maximum/minimum)
2. Let and constant. Use the slider to change the value of Describe how the graph changes as changes.

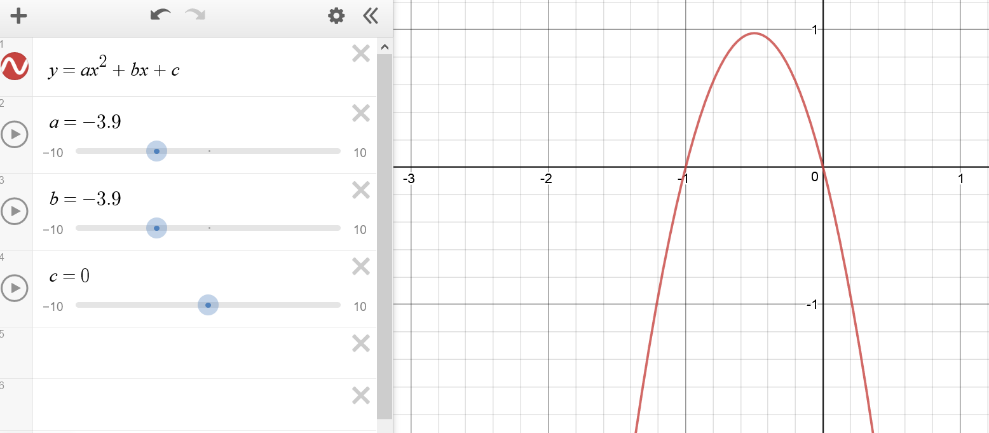
**The parabola goes up and down the y-axis. Once it goes down, it goes into the negatives, so the minimum would change. C represents the y-intercept, so when we change C’s values the y-intercept changes.**

**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: **Y= 3.5x2 – 0.9x + 0**

This quadratic equation has ONE solution.

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

              Equation: Y= **-3.9x2 + 3.9X + 0**

This quadratic equation has TWO solutions.

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

              Equation:  **Y= 0.5x2 -0.1x +10**

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