Exploring quadratic functions (7.1)

Follow the instructions laid out in this worksheet and post your answers in a blog post. Your post must include at least 2 photos from www.desmos.com.

Due: Wednesday Feb 21st 2018

Title: Exploring quadratic functions

Categorize: Math 11

1. Find and write the definition of a quadratic function in words you understand. (use your textbook, google, etc)
2. Give an example of a quadratic function and give an example of a function that is NOT a quadratic.
3. Go to desmos.com and type in the following function: $y = ax^2 + bx + c$
   a. 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.
   b. Start with slider values $a = 1,\ b = 0,\ c = 0$. Describe any symmetry you notice.
4. Now, compare two functions:
5. Keep b and c constant (ie. Don't change their value). Describe what happens to the graph when:
   a. $a < 0$
      i. Does the graph have a maximum point or a minimum point?
   b. $a > 0$
      i. Does the graph have a maximum point or minimum point?
   c. $-1 < a < 1$
   d. $a > 1\ or\ a < -1$

   Note: Be specific in your description.

6. We call the maximum or minimum point (x, y) of a quadratic function the **vertex**. Make two statements that describes the relationship between the sign of a (positive and negative) and whether the vertex is a maximum or minimum.
7. Keep a and b constant. Describe how the graph changes as c changes.

Part 2:

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

See if by adjusting the sliders, you can get a curve that just touches the x axis (y=0).

Equation: _____

This quadratic equation has ONE solution.

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

Equation: _____

This quadratic equation has TWO solutions.

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

Equation: _____

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