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 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)
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. Keep b = c = 0. Change the value of a:
   a. $a < 0$
      i. Does the graph open up or open down?
      ii. Does the graph have a maximum point or minimum point?
   b. $a > 0$
      i. Does the graph open up or open down?
      ii. Does the graph have a maximum point or minimum point?
   c. $-1 < a < 1$
      i. Is the graph narrow or wide?
   d. $a > 1\ or\ a < -1$
      i. Is the graph narrow or wide
5. We call the maximum or minimum point (x, y) of a quadratic function the **vertex**. Complete the following statements:
   a. When a is _____(positive/negative), the vertex is a _____ (maximum/minimum)
   b. When a is _____(positive/negative), the vertex is a _____ (maximum/minimum)
6. Let $a = 1$ and $b = 0$ constant. Use the slider to change the value of c. Describe how the graph changes as c 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: _____

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: _____

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