

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 desmos. Due: Monday Sep 25.

Title: Exploring quadratic functions

Categorize: Math 11

1. What is a quadratic function? Give an example.
2. Go to [desmos.com](https://www.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.
3. 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.

4. We call the max or min 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.
5. Keep a and c constant. Describe how the graph changes as b changes.
6. 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.