

7.1 Exploring Quadratic Relations

Quadratic Relation: _____

Parabola: _____

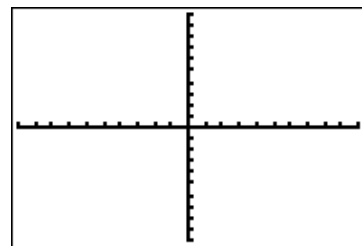
In this lesson we will be exploring the characteristics of parabolas. To do this, you will be graphing a number of quadratic functions using your calculator. Use a standard window and sketch each set of functions; then comment on the changes in the graph.

A. Changing the value of c :

$$y = x^2 + 2x - 5$$

$$y = x^2 + 2x + 1$$

$$y = x^2 + 2x + 4$$

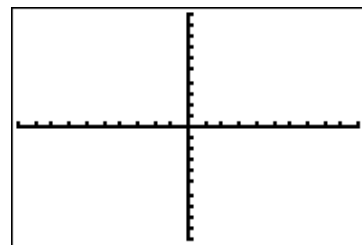


B. Changing the value of b :

$$y = x^2 - 3x - 5$$

$$y = x^2 + 2x - 5$$

$$y = x^2 + 7x - 5$$

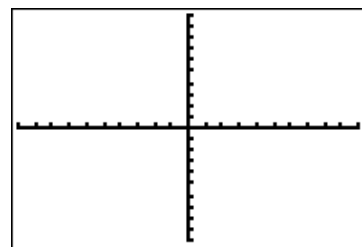


C. Changing the value of a , $a > 0$:

$$y = x^2 + 2x - 5$$

$$y = 2x^2 + 2x - 5$$

$$y = 4x^2 + 2x - 5$$

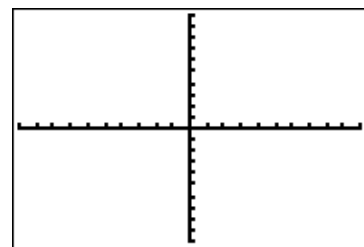


D. Changing the value of a , $a < 0$:

$$y = x^2 + 2x - 5$$

$$y = -x^2 + 2x - 5$$

$$y = -3x^2 + 2x - 5$$

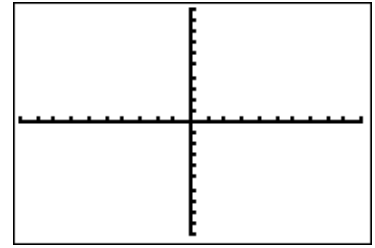
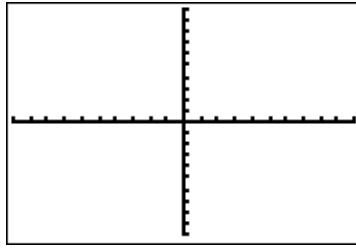
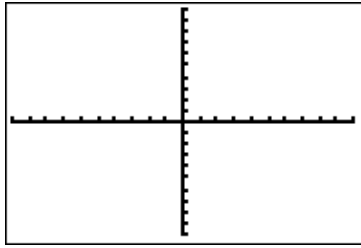


What if a , b or $c = 0$? For each of the functions below, PREDICT what will happen to the graph and then verify using your calculator.

$$a = 0: y = 4x - 1$$

$$b = 0: y = 4x^2 - 1$$

$$c = 0: y = x^2 - 5x$$



Characteristics of Quadratic Functions:

- When graphed, the function is in the shape of a _____.
- When graphed, a quadratic function is _____.
- The parabola has a _____ line down the center which acts like a mirror. This line is called the _____.
- Standard form of a parabola is _____.
- The highest or lowest point on the parabola is the _____ or _____ respectively and is always on the line of symmetry.
- If " a " is positive, the parabola opens _____.
- If " a " is negative, the parabola opens _____.
- Changing the value of " b " moves the parabola; therefore, changing the location of the _____.
- The constant term, c , is the value of the parabola's _____.