# Writing Functions

Just as it is important to know how to evaluate functions, it is also important to know how to write them from tables and graphs. This lesson will show you how to do that.

***The key to writing functions is to first figure out what kind of function (linear, quadratic, absolute value etc.) you are dealing with before plugging points into the general equation for that kind of function.***

Let's practice this with tables and graphs!

| $x$ | $y$ |
|---|---|
| 0 | 3 |
| 2 | 11 |
| 4 | 19 |
| 6 | 27 |
| 8 | 35 |

Credit: jeopardylabs.com

Since the x and y coordinates are changing by the SAME amount for each pair, we are going to write a LINEAR function.

Linear functions are in the form y = mx + b, so we need to find m (the slope) first before using one of the coordinate pairs in the table to find b and write our equation.

Let's use (2, 11) and (4, 19) to find the slope!

$$\text{Slope} = \frac{19-11}{4-2} = \frac{8}{2} = 4$$

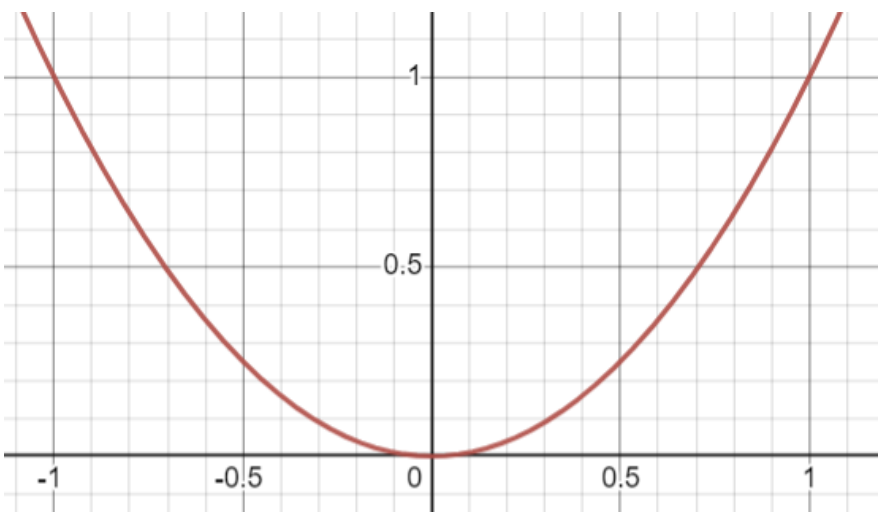
Use one of the points from the table - we will use (0, 3) - to help us find b.

**y = 4x + b**

**3 = 4(0) + b**

**b = 3**

**y = 4x + 3**




This is a QUADRATIC function with no Y-INTERCEPT (no c value). The vertex is (0, 0) so the b value of the quadratic is 0 (-b/2a for the X-COORDINATE of the vertex where a CANNOT be 0). Since the quadratic goes through (1, 1) and (-1, 1), the a value is 1 and the function is:

**$y = x^2$**

**Tips for Solving Problems**:

1. Make sure you know the different forms of functions that you need to write (typically, it will be linear, quadratic and absolute value functions)! If you do not know how to write the forms of these different functions, make sure to review the lessons that go over them.

2. Make sure you know how to analyze tables and graphs well in order to write these functions! In tables, look for the x and y coordinate pairs and determine the relationship between them to determine what type of function you are dealing with.

For graphs, try to look for features like x-intercept, y-intercept, slope and certain points that help you determine the function you are looking at.

3. Keep practicing the various approaches needed to identify what kind of function you are looking at and how you write the function in its respective form! You will get better at it with practice!