Graphing Quadratic Functions

- As we work through this chapter, you will see that quadratic functions can be expressed in many different forms including:
  - Transformational Form: $\frac{1}{a}(y-k)=(x-h)^2$; where $a \neq 0$
  - Standard Form: $y=a(x-h)^2+k$; where $a \neq 0$
  - General Form: $y=ax^2+bx+c$; where $a \neq 0$
- We will look at each of these forms along with the characteristics that each of them show us. We will begin by reviewing Transformational Form from Math 10.

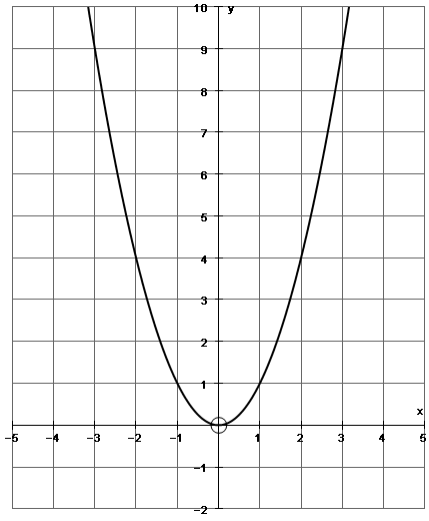
Transformational Form (TF) of a Quadratic Equation

- In previous math courses, we have expressed a function using many different forms. One of those forms was **mapping notation**. Mapping notation tells us how to get the image of a given graph. In the following lessons, we will review using mapping notation to show how we can generate an image graph of a **quadratic** function under various transformations.
- Example:

The standard base table of values for the quadratic $y=x^2$ is given by:

x	y
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9

When the points in the table of values are graphed, we get our base **parabola**:



The graph of the function is in the shape of a curve or parabola. The domain of the function is $D = \{x \mid x \in \mathbb{R}\}$ and the range is $R = \{y \mid y \geq 0,\ y \in \mathbb{R}\}$.

- All transformations and image graphs created in this chapter will be applied to the base quadratic function $y = x^2$. Because of this, we will be looking at the change in ordered pairs (the points on the curve) which will then be used to graph the new image function.