

## The Graph of a Quadratic Function

What are some properties of quadratic functions?

Let's look at one way to represent functions using bracket notation (sometimes called Vertex Form).

This function  $f(x) = 3(x - 4)^2 - 8$

...can also be written as  $y = 3(x - 4)^2 - 8$ .

Is this a quadratic function? What would help you decide?

We can check by looking at the function graphically. You know that quadratic functions form parabolas, which have the characteristic "U"-shaped curve that opens up or down.

So, first let's look at the table of values generated from this function for x inputs of 1 to 6.

y-values can be found by substituting x-values into the function.

An x input of 0 results in a y-output of \_\_\_\_

An x input of 1 results in a y-output of \_\_\_\_

An x-value of 2 results in a y-value of \_\_\_\_

...and so on...

Now, plot these (x, y) pairs.

**When you have completed the table of values, press "Plot Points" – the applet will plot the graph if your (x, y) pairs are correct.**

Notice that the plotted points for this function form a parabola. This means it is a quadratic function.

There is a second way to confirm this. All quadratic functions are 2<sup>nd</sup> degree polynomials which means they have a variable raised to the second power.

In this example, notice that the bracket which contains an x-value is squared.

This is one way to represent quadratic functions. You can now practice one more time by clicking the "New Question" button and substituting values of x to find (x, y) pairs.