Graphing Quadratic Functions

The graph of a quadratic function is a parabola.

←The vertex is
the turning point.

It can open up with
the vertex being a
minimum

←The vertex is
the turning point.

Or it can open down
with the vertex
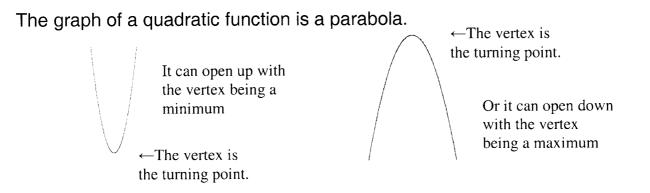being a maximum

Finding the vertex is necessary to graph the parabola and for answering any questions regarding maximums and minimums.

The two formats that we use for quadratic functions are listed below.

General: $y \; or \; f(x) = a(x - h)^2 + k$ where the vertex is (h, k)
or
Standard: $y \; or \; f(x) = ax^2 + bx + c$ where the vertex can be found by the

formula $x = -\dfrac{b}{2a}$ and y is found by plugging the x into the function.

In either format the "a" is the same value. If a is positive, the parabola opens up and if it is negative, the parabola opens down.

To Graph a Parabola:

1.   Find and plot the vertex
2.   Pick two x values smaller (or larger) than the x-coordinate of the vertex. Find the y-values and plot the points.
3.   Draw your line of symmetry locate the image of the points from step 2 on the other side of the line of symmetry.
4.   Draw the parabola.

On problems where you are asked to maximize or minimize a value you will find the vertex of the parabola. The maximum or minimum is the "y"-coordinate and it occurs at the "x"-coordinate.