Course: Algebra 2
Unit: Conic Sections
Section: Parabolas

Example: Graphing a Parabola with a Vertex at the Origin

Problem:
Graph the parabola x equals negative one-eighth y squared.

Solution:
Before we start to graph the parabola, we must decide if the parabola has a vertical or horizontal directrix and which direction the parabola opens. To do this easily, we should first write the equation in its standard form.

This equation can be rewritten in the form x equals 1 divided by the product of four times negative two, times y squared. Because it is in the form "x equals…", this has a vertical directrix and because the value of p is negative, negative two to be precise, the parabola opens to the left.

The vertex of this parabola is zero, zero.

The directrix of this parabola is x equals negative p, x equals negative negative two, or x equals two.

The focus of this parabola is at p, zero. This is the point negative two, zero.

Once we have the vertex, directrix and focus, we can begin to graph. Place those three things on the graph.

Now, in order to make our graph as accurate as possible, let's plot a couple more points. Pick one point on either side of the focus. In this case, pick one point above it, at y equals two, for example, and one point below it, at y equals negative two, for example.

When y equals two, we can use the equation to find the value of x.

X equals negative one-eighth times two squared equals negative one-half.

The point negative one-half, two is on the parabola.

When y equals negative two, we can again use the equation to find the value of x.

X equals negative one-eighth times negative two squared equals negative one-half.

The point negative one-half, negative two is also on the parabola.

Now all that is left is to graph the parabola itself, using the points as a guide.

Notice that the parabola opens to the left around the focus.