

## Domain and Range

The domain is the set of all possible input values, and the range is the set of all possible output values for the function.

Let's look at the parabola in the graph on this applet. (You may be able to guess its equation; however, let's focus on the domain and range for this graph.)

Remember that the parabola extends infinitely upwards and outwards for this parabola. The graph does not stop at the margins of your screen or on the grid that you can see; the parabola exists beyond what you can see on the graph.

To use this applet, select and hold the point that is at the vertex, and slide the point continuously over the graph.

As you move the point on the graph, you will see that the x-axis lights up in green as you trace it, and that the y-axis lights up in purple as you trace it. This shows all the possible values of  $x$  in green (the domain) and all the possible values of  $y$  in purple (the range).

Since this graph extends infinitely to the left and to the right, its domain is from negative infinity to positive infinity.

Since the graph's lowest point is zero, and it extends infinitely in the upward direction, its range goes from zero to infinity.

Select those choices in the applet.

The Lower Bound is the minimum value for the range. In this case, it is 0.

Since the range extends infinitely in the upwards direction, there is no Upper Bound for the range.

### Activity

Select "New Graph", and try the other three examples in this applet.