3.1 Notes: Quadratic Graphs

Recall the following facts regarding the graph of .

* Vertex is at
* is the line (axis) of symmetry
* Opens up.

Thus, the more general quadratic function contains all possible dilations, translations, and reflections across the axis (allowing for to be negative). Note from our previous lesson on graphing techniques that:

* Vertex is at
* is the line (axis) of symmetry.
* Stretched vertically if | and shrunk vertically if .
* Opens up if and down if .

So our strategy for graphing quadratic functions is simple.

* Know the features of extremely well.
* Complete the square if necessary to write the function in vertex form:
* Graph and/or write down key features based on the translations, dilations, and reflections present.
* -intercepts and -intercepts are often helpful in forming the graph. Do you remember how to find them?
  + Find the -intercept by …
  + Find the -intercept(s) by …

**Examples:** Give the vertex, axis of symmetry, domain, range, the largest open interval of the domain for which the function is increasing and decreasing, -intercept, -intercept(s), and the minimum or maximum value of the function. Also graph the function.

Given the following graphs, write the equations that will produce the graphs and state the same information as the previous problems.



