Function Design Project

You are to create a design consisting of line segments, "V"s (absolute values) and parabolas. You may spell your name, draw a picture or make a more abstract geometric design. This project will count as several quiz grades.

Your project should include the following:

- 10 Functions:
  - 6 Linear functions:
    - 1 linear function that is horizontal
    - 2 linear functions that lean to the right
    - 2 linear functions that lean to the left.
    - 1 line that is vertical. (You will NOT write an equation of the function for this line, because it is NOT a "function". You will only have to define its domain and range and complete a data chart for it.)
  - 2 Quadratic Functions (Parabolas):
    - 1 quadratic function that opens upward
    - 1 quadratic function that opens downward
  - 2 Absolute Value Functions:
    - 1 absolute value function that opens upward.
    - 1 absolute value function that opens downward
- The domain and range for the portion of each function you have drawn.
- Design should use all four quadrants.
- You may use as many lines, parabolas, and absolute values as you want in your design, but you will only label and complete data tables on 10 of those functions, as defined above.

Procedure:

- All work should be neatly done. Rulers or a straight edge should be used for all straight line drawings.
- On graph paper label your axes and mark your scale (if different than units of one).
- Neatly draw your design on the graph paper using a ruler where applicable.
- Translate the lines, parabolas and absolute values on your design to equations of functions:
  - number the lines, parabolas, and absolute values in your drawing to match their respective numbered data tables included below
  - enter ordered pairs from your design into their data tables for each function numbered; include vertices of your parabolas & absolute value functions; use whole number values whenever possible; remember that parabolas and absolute value functions are symmetric
  - determine the equation of the function with the help of your graphing calculator
  - identify the domain and range of each function

Remember your Basic Function Formats/Equations:

Linear: $y = mx + b$

Absolute Value: $y = a|x - b| + c$

Quadratic: $y = a(x - b)^2 + c$

1. Equation:

x	y

Domain:

Range:

2. Equation:

x	y

Domain:

Range:

3. Equation:

x	y

Domain:

Range:

4. Equation:

x	y

Domain:

Range:

5. Equation:

x	y

Domain:

Range:

6. Equation:

x	y

Domain:

Range:

7. Equation:

x	y

Domain:

Range:

8. Equation:

x	y

Domain:

Range:

9. Equation:

x	y

Domain:

Range:

10. Equation:

x	y

Domain:

Range: