THE ROLLER COASTER PROJECT

1. On any physical or digital paper, draw an x-axis and y-axis. Sketch a side view of a simple roller coaster that has at least two hills and one loop. Label the increments on the x-axis and y-axis in feet.

2. Mark one point near the bottom of the first uphill, and mark one point near the top of the first uphill. Choose points that you can tell what the coordinates are, then write the coordinates next to each marked point. Remember, it's (x, y).

3. Mark one point near the top of the first downhill, and mark one point near the bottom of the first downhill. Then repeat this for the second downhill. Choose points that you can tell what the coordinates are. Write the coordinates next to each point you just marked.

4. Write down the domain of your coaster. This is the domain of the entire coaster, not just the domain of the points you marked. Then, write down the range of your coaster. Again, this is the range of the entire coaster.

5. Calculate the slope between the two points of the first uphill. Show your work.

6. Use this slope to find the equation for the line between these two uphill points. Use the point-slope form, and then simplify. Show your steps.

7. Calculate the slope (also known as the rate of change) between the two points you marked on the first downhill. Then, calculate the slope between the two points you marked on the second downhill. Show your work.

8. Identify which downhill is steeper, and explain how you determined this from their slopes.

9. Determine whether or not the graph you've drawn for this coaster qualifies to be called a function. Then tell why or why not it is a function. Hint: Review the definition of a function and the vertical line test for a function.