Math 4 Honors Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Math & Engineering Project Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Learning Goal:**

* *I can improve my understanding of piecewise functions and parametric equations by describing the path of a roller coaster with data from real-world conditions, outdoors, at full speed.*

Up to this point, the engineering students have been doing the majority of the work. They did a great job designing and building the GPS devices. Furthermore, they successfully collected and extracted the data we need to accomplish our learning goal. Now it’s our turn!

Here are the tasks that we need to complete:

1. Using *Excel*, create a scatterplot of time (in seconds) versus height (in feet). Then find the equation

that represents your rollercoaster’s height (in feet) as a function of time (in seconds). This will be your *y*(*t*) equation.

Notes:

2. Using *Excel*, create a scatterplot of time (in seconds) versus horizontal distance (in feet). Then find

an equation that represents your rollercoaster’s horizontal distance (in feet) as a function of time (in

seconds). This will be your *x*(*t*) equation.

Notes:

3. Graph your parametric equations in a graphing calculator.

4. Using *Excel*, create a scatterplot of the horizontal distance travelled versus height. Create a

piecewise function that will represent the complete ride. (Divide your graph into at least 3 pieces).

Notes:

5. Graph your piecewise function in a graphing calculator.

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6. Create a Google Slides presentation containing the following:

* A picture or two of your rollercoaster
* Some facts and data about your rollercoaster
* All 3 scatterplots
* Your parametric equations and their graph
* Your piecewise function and the graph
* Commentary on strengths and weaknesses of your graphs and equations
* Anything else you think would be beneficial in your presentation

Notes: