Name(s): _____ _____ _____

ROLLER COASTER PROJECT: PART 2

You/your team decided to become a structural engineer who specializes in roller coaster design.
Your job is to design your own roller coaster ride. To complete this task, please follow these steps:

The amusement park you are designing for, gave you the following coaster requirements:
- the coaster must have at least four unique intervals (your choice on length of each)
- the ride must last a minimum of one minute
- each interval must have at least 3 relative maxima and/or minima
- the coaster ride starts at 250 feet
- the ride dives below the ground into a tunnel at least once

Use a clean sheet of butcher paper to write your report on you roller coaster design. Label each part clearly and give your coaster a name. Your work must be neat, organized and must appear professional.

1. Draw a large design of your "roller coaster" ride on a coordinate plane.
   Note: Be sure to illustrate your x-axis and y-axis scale to identify the length of the ride and the height of the ride you are designing. Make sure your design meets all the criteria listed above.

2. List all zeros or roots of your polynomial; be sure to include at least one of the following in each interval on your design: all double roots (multiplicity of two), all real roots, all imaginary roots, and your choice.

It might be necessary to go back to your design and modify it according to these root requirements.

3. Write the complete factored form of your roller coaster polynomial.

4. Show the conversion to standard form that represents your roller coaster ride.

5. Perform synthetic division to verify the correctness of your equation.

6. Describe each interval's end behavior of your function and give a reason for their behaviors.

7. Draw an accurate graph of your coaster and label each equation over its interval.

8. State the domain of each interval.

9. State the range of your graph (that is, the actual ride).

10. Color the graph blue where the coaster is increasing and red where the coaster is decreasing. Identify the increasing and decreasing intervals over the whole ride.

Resource: Google: Polynomial Roller Coaster Project
[Doc] **GIFT 2 Roller Coaster Polynomials KEY**
*www.gvsu.edu/.../gift_2_**roller_coaster_polynomials**_key-1.doc*