

Roller Coaster Project

You are entering a bid to design the next roller coaster for an amusement park.
Bids are due for Tuesday May 20th.

In order for your roller coaster to be considered, it must be a **piecewise function of 3 parts**, so that the function is continuous at the endpoints of each interval. Your last function must take into account that the platform at the end of the ride is **8 feet** high (the platform is infinitely long.)

Your piecewise function is the position function for your roller coaster.

Include an evaluation of your velocity:

- The velocity equations with appropriate domains
 - Where the velocity is zero (or undefined) over the appropriate domains
 - Where the roller coaster is moving up (right)
 - Where the roller coaster is moving down (left)
- ➔ You must state the intervals and a sentence justifying how you know the coaster is moving up or down based on the velocity.
- ** Note: each of your transition points is a critical point

Include an evaluation of your acceleration:

- The acceleration equations with appropriate domains
 - Where the acceleration is zero (or undefined)
 - When the roller coaster's velocity is increasing
 - When the roller coaster's velocity is decreasing
- ➔ You must state the intervals and a sentence justifying how you know the velocity is changing based on the acceleration
- ** Note: each of your transition points is a critical point

Include an equation of the tangent line 5 units after the start of your roller coaster (or at $x = 3$, if you have no defined starting point).

There is an automatic camera when the height of your roller coaster is 5. Use the Intermediate Value Theorem to show that your function will have a y-value of 5 (at least once).

Projects showing extra effort and performance can earn extra-credit.

Group Guidelines

You may complete the project with one other person (a group of 2).
In your final project you must include documentation of who did what work.

Project is due

Tuesday May 20th