

Honors Algebra 1: Final Project

Roller Coaster ZOOM ZOOM



For this project you are going to be a Roller Coaster Designer! You will take everything we have learned about rates of change, conversions, and functions to work through the creation, design and speed of a roller coaster.

PART A: Desmos Design:

You will use desmos to graph functions that create a continuous roller coaster. You will need to use at least 5 different functions with at least one linear, one quadratic, and one exponential. You will need to use domain restrictions in order to isolate only the part of the function you want visible. All functions MUST be continuous to one another and must stay above the x axis (your roller coaster cannot go underground and there can be no holes!)

You need to make a Desmos account so you can save your work and print your rollercoaster and function

Questions?: Here is the Demos user manual

https://desmos.s3.amazonaws.com/Desmos_User_Guide.pdf

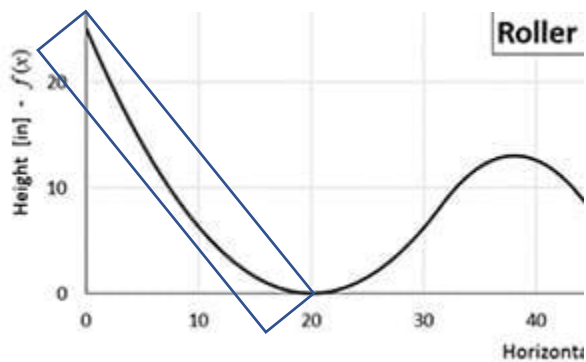
Need to limit the domain or range?

Type the function in, and then in curly brackets, type the limitation. For example if I want the quadratic parent function just between -2 and 2, I type: $y = x^2\{-2 \leq x \leq 2\}$. Try it and see how it works.

Description	Points Possible	Points Earned
At least 5 unique functions are used	20	
All three functions are represented	5	
The roller coaster is continuous	5	
The roller coaster is above the x-axis	5	
Appearance (did you add a name for your rollercoaster and add a background image?)	10	

PART B: Rate of Change

Using your roller coaster design you will need to determine the rates of change for each section of your roller coaster. For every interval of change (increase or decrease) determine the rate of change, if that section of the roller coaster is increasing or decreasing, and if the rate of change is constant or changing for that interval



EXAMPLE: The rate of change from 0 seconds to 20 seconds is decreasing at a changing rate of change. $(0,25) (20,0)$. So the rate of change is -1.25 meters per second.

Description	Points Possible	Points Earned
Rate of change is correctly found for each interval	15	
Increase/decrease and constant/changing is found for each interval	5	

PART C: Conversion

For each interval found in part B you will need to convert the speed from meters per second into miles per hour

Description	Points Possible	Points Earned
Conversion is correctly done for each interval	15	

PART D: Designing the car

Now you get to be creative and actual design what the car would look like for your roller coaster! Get Creative!

Description	Points Possible	Points Earned
Unique, neat, and well-designed roller coaster car	10	

Total Points: