Module 3 Characteristics of Functions PROJECT – Day 1

Team Member Names:

_____

_____

Congratulations! You and your group have been chosen to design the new roller coaster at Math Land! All the rides at Math Land have mathematical themes and you are designing a function coaster.

Part A - Plan

1. Come up with a **name** for your roller coaster
2. You want this roller coaster to have a little bit for every type of guest, so think about what it is going to look like. Your coaster **must go underground at least once**.
3. On a piece of **lined paper** or **on the back of this paper**, **sketch** an idea for your coaster. It must have **at least 5 functions** built into it and **contain at least one of each kind** – linear, quadratic, exponential, and logarithmic. [T1]
4. **Go to Linerider.com** and make sure your roller coaster is safe!! Sketch your roller coaster and press play to see if your customers will make it to the end of your coaster. We don't want any lawsuits! [T0]
5. Capture a **video** and **upload** it to Canvas.

Submitted	Coaster Sketch w/ 5+ functions	LineRider Video
Approved		

Part B - Graph it out! [T0]

1. Take your sketch and **transfer** it to a piece of **graph paper**. Make sure that important parts of your coaster hit easy to find coordinate points.
2. You must **draw and label your axes** and put a **title on your drawing**.
3. Your **x-axis is the length of time** for the coaster and the **y-axis is the height of the coaster**.
4. Your coaster **must go underground at least once**.
5. **Color each function a different color** on your coaster. [T1]

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Part C - Function Characteristics Coaster Name: _____

Fill in the chart.

Domain & Range [T2]	D:	R:
Intercepts [T3]	x-intercepts	y-intercepts
Zeros [T3]		
Absolute minimum and maximum [T3]	Max:	Min:
Increasing and decreasing intervals [T4]	Increasing:	Decreasing:
End behavior [T4]	$As\ x \to -\infty, y \to$ _____	$As\ x \to \infty, y \to$ _____
Asymptotes [T4]		

Use the information in your chart to fill in the blanks on the next page.

Part D - Fill in the blanks. *(An editable version is in Canvas if you need to adjust to fit your coaster graph*).

Let's go for a ride on the _____ roller coaster, which is _____ seconds long. The roller coaster begins at _____ feet from the ground. [T2] After _____ seconds we will reach the maximum height of _____ feet. [T3] Therefore, the values for the domain of this roller coaster are _____ and the range is _____. [T2] We will be moving slow during the intervals of _____ because we will be going _____ hill, which means these are the (select 1: **increasing**, **decreasing**) intervals. We will be moving very fast during the intervals of _____ because we will be going _____ hill, which means these are the (select 1: **increasing**, **decreasing**) intervals. [T4] We go underground at the _____ intercept which is _____ seconds from the start and come back above ground at the _____ intercept which is _____ seconds from the start. [T3] Our coaster gets closer and closer to the ground at the end but never touches which means that y = _____. [T4]

Module 3 Characteristics of Functions PROJECT – Day 3

Part E - Poster [T0]

Glue/tape your finished roller coaster graph onto poster paper.

Your poster MUST include the following:

- title
- roller coaster graph
- all of the info from your function characteristic chart

Your poster should be neat, colorful, and free of spelling errors.

Part F - Presentation [T0]

Your group will present your roller coaster and all the information to the class. Each person in your group must speak, so decide ahead of time who is going to say what. A good way to split up speaking is to have each member read a section of Part D.

AFDA Module 3 Characteristics of Functions Project Rubric

Section	4 points	3.5 points	3 points	2.5 points	2 points	1.5 points	1 point	0.5 points	0 points	Totals
Part A #3 Coaster Sketch	COMPLETE Contains at least 1 of each function with min of 5		Contains 1 of each function but less than 5 total		Contains only 1 of each function		Contains 2 of the functions discussed	Contains only 1 of the functions discussed	Not answered	**/4** (T1)
Part A #4 LineRider	Sent line rider AND rider made it safely to the end of the ride				Line rider was safe but did not make it to the end of the ride		Sent line rider BUT rider crashed and/or burned		Not answered	**/4** (T0)
Part B Graph	Fully correct with title, axes labels, hits points, underground	Graph has 4 requirements correct	Graph has 3 requirements correct		Graph has 2 requirements correct		Graph has 1 requirement correct	Graph made but does not have any of the requirements	Not answered	**/4** (T0)
Part B #5 Function Coloring	Each function color coded; with KEY identifying function color AND correct type		All functions colorized; color key provided but 1 or more function types mislabeled		All functions colorized; color key does not contain function types		All functions colorized; no color key provided	At least one function colored	No functions colored	**/4** (T1)
Part C Domain and Range	Fully correct	Domain **or** Range fully correct	2 minor errors in numbers **or** symbols		Used correct symbols but incorrect numbers	Described D & R correctly with no symbols	Described D & R incorrectly with no symbols	Wrote something	Not answered	**/4** (T2)
Part C Intercepts	Fully correct	1 minor error		2 intercepts completely correct		1 intercept completely correct	Correct intercepts with x=	Incorrect intercepts and incorrect symbols	Not answered	**/4** (T3)
Part C Zeros	Fully correct			1 correct zero			Correct zeros written as intercepts	Incorrect zeros with incorrect symbols	Not answered	**/4** (T3)
Part C Extrema	Fully correct	1 minor error	1 correct extrema		Correct extrema not written as points		Incorrect extrema written as points	Attempted but none correct	Not answered	**/4** (T3)

Part C Intervals	Fully correct	Had all intervals with 1 minor error	Missing 1 interval	Had all but 1 interval with 1 minor error	Missing 2 intervals	Missing 2 intervals with 1 minor error	Missing more than 2 intervals	Attempted but none correct	Not answered	**/4** (T4)
Part C End behavior	Fully correct			1 end behavior correct				Attempted but none correct	Not answered	**/4** (T4)
Part C Asymptotes	Fully correct		1 error			Right train, wrong car		Attempted but none correct	Not answered	**/4** (T4)
Part D T2	Fully correct		3 correct		2 correct		1 correct	Attempted but none correct	Not answered	/**4** (T2)
Part D T3	Fully correct	5/6 correct	4/6 correct		3/6 correct	2/6 correct	1/6 correct	Attempted but none correct	Not answered	/**4** (T3)
Part D T4	Fully correct	6/7 correct	5/7 correct	4/7 correct	3/7 correct	2/7 correct	1/7 correct	Attempted but none correct	Not answered	/**4** (T4)
Part E	Poster meets all requirements and is neat	Missing 1 minor thing	Poster meets all requirements but is sloppy	Missing 1 requirement but neat	Missing 2 requirements **OR** missing 1 and sloppy	Missing 2 **AND** sloppy	Missing more than 2 requirements	Has something math related on the poster	Nothing turned in	/**4** (T0)
Part F	All members of the group spoke and didn't act silly		All members of the group spoke but they were silly	1 member did not speak			More than 1 member did not speak			/**4** (T0)
Comments								**T0 ____ /4 = ____ ____%** **T1 ____ /2 = ____ ____%** **T2 ____ /2 = ____ ____%** **T3 ____ /4 = ____ ____%** **T4 ____ /4 = ____ ____%**		

Grade Conversions	Score	4	3.5	3	2.5	2	1.5	1	0.5	0
	% Grade	100 %	90 %	85 %	77 %	70 %	65 %	60 %	50 %	0%