Wile E. Coyote

Wile E. Coyote Writing Project

The following group project is to be worked on by *no more than four* students. You may use any materials you think may be useful in solving the problems but *you may not* ask anyone for help other than the people you have chosen to work with. This means you may not ask a tutor or any person other than those in your immediate group for help.

You are to type a response to the problem presented backing up your conclusions with mathematical reasoning, formulas, and solutions. Your grade will depend on how well you communicate your response as well as the accuracy of the conclusions. This project will be scored using the rubric on the last page of this document.

Please sign and date here to indicate that you have read and agree to abide by the above mentioned stipulations.

_____ _____
Student Name #1 Date

_____ _____
Student Name #2 Date

_____ _____
Student Name #3 Date

_____ _____
Student Name #4 Date

Wile E. Coyote

Wile E. Coyote
4 Corner's Rural Route
Monument Valley, AZ 27182

Chandler-Gilbert Community College
MAT 187 Students
7360 East Tahoe Avenue
Mesa, AZ 85212

Dear Trigonometry Trainers,

As you well know, I have tried countless times over the years to catch that ever so elusive Road Runner! I have been frustrated so many times regardless of whatever ingenious scheme I could come up with that I had just decided to quit trying when I received a package in the mail from the ACME Corporation. It seems that I have purchased more materials than any of their other customers in the past so they wanted to show me their appreciation. (Undoubtedly they didn't want to lose me as a customer either.) They sent me a guaranteed ***NO FAIL*** method of finally catching the Road Runner (Accelerath Incredibilis)!

Upon studying the contents of the package, I found the plans lay out the building of a roller coaster track that can be built into the side of a mountain. Immediately I fell in love with the idea! What a marvelous idea to wait for the Road Runner to come running by and then roll up next to him in the roller coaster car and grab him! The most appealing aspect of the plan is that the last portion of the roller coaster is to go under ground level. This will allow me to sneak up on the Road Runner so that he will not even know that I am there!

Being a registered, certified, and card-carrying Grade AA Genius, I was sure that I could figure out the plans well enough on my own to build it. However, I have come up with a couple of snags in that the process requires some mathematics to finish the project and need your expert help. The only body of knowledge that I have not studied extensively is mathematics because frankly, out here in the middle of the desert I never really thought I would need it. I do now! I will fill you in on what I know and what information I need.

The ACME plans provide the following information:

- The roller coaster is to be built in the shape of a sinusoid (see the figure provided on the following page).
- The high and low points on the track are to be separated by 50 meters horizontally and by 30 meters vertically.
- The low point is to be 3 meters below the ground.

- The vertical timbers are to be spaced every 2 meters, starting at the base of the mountain (x = 0) and ending where the track goes below the ground. The horizontal timbers are to be spaced every 3 meters.
- Don't forget that there has to be a front and backside to the roller coaster (or it would just fall over!).
- At each intersection of horizontal and vertical timber, there is a 1 meter timber tie between the two sets of coinciding supporting timbers.
- Timber supports will cost $3.00 a meter.

Since the ACME kit comes with the steel rails and cart but not the timber supports, please provide me with the following information:

- So I can try to understand the mathematics behind your calculations give me a general formula for the sinusoidal roller coaster track.
- What is the length of the vertical timber I need at the high point?
- What is the length of the horizontal timber I need that will be 24 meters above the ground?
- Where will the track first go below ground?
- Where will it first come back out from below ground level?
- What are the lengths of each horizontal and vertical timber support?
- What is total length of all the timber supports so that I will know how much to purchase?
- How much money will it cost me to purchase the timber supports?
- Finally, with my storied history of accidents, I am a little concerned about heights. Can you give me an estimate of how steep the roller coaster will be at its steepest point?

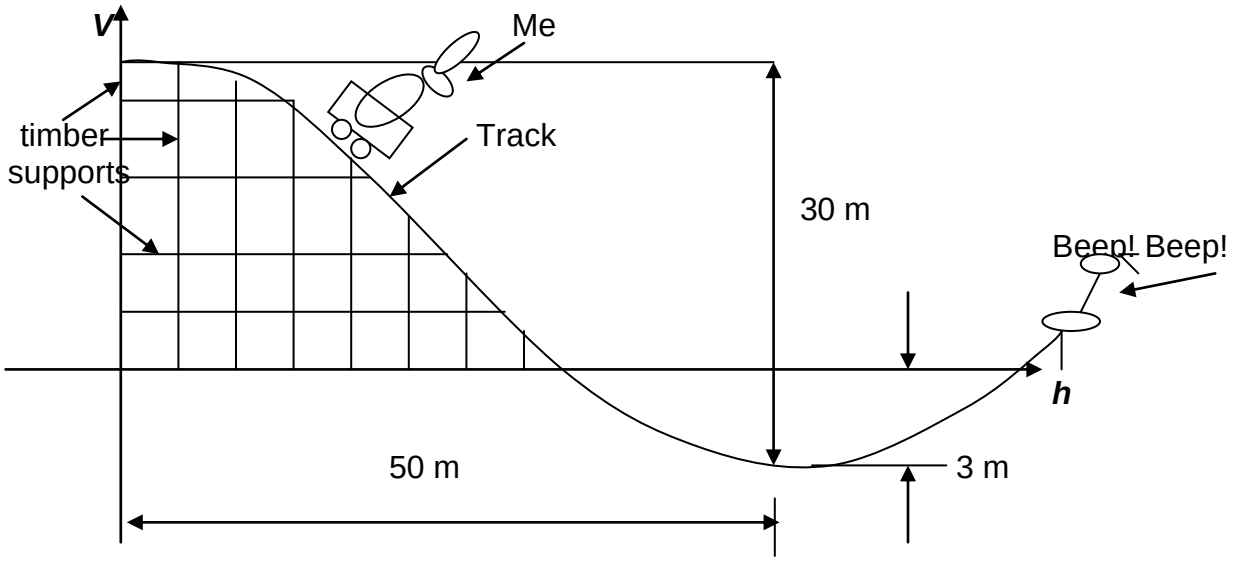
It has been so long since I have had the delicacy of Road Runner Delight, I would appreciate your response by _____. This will give me enough time so I can make preparations for the best meal I have had in years and invite the whole den over!

I anxiously await your reply…,

Wile E. Coyote ♉ (Carnivorous Vulgaris)

P.S. A note from your resourceful and enterprising professor: In developing a general formula, let ***v*** be the number of meters the track is to be above the ground and ***h*** the number of meters horizontally from the high point. See the next page for the diagram.

Wile E. Coyote



Wile E. Coyote

Writing Project Evaluation/Checklist

Gateway checklist - these items must be present in order for the paper to be evaluated:

Yes	No	Expected Features
		1. Is the work all computer generated?
		2. Is there algebraic (symbolic), numerical (tabular), and graphical support included in the work?
		3. Is there a description of the solution(s)?
		4. Is the noise (i.e. grammatical, punctuation, spelling, etc. errors) level low enough to not cause communication problems?
		5. Is the project free of major errors?
		6. Is acknowledgment given where it is due, if appropriate?

Your final score will be calculated based on your performance on these features:

Very Good	Good	Poor	Features
			Clear and complete summary of the problem(s) to be solved • Introductory paragraph lays the background for the problem situation and its solution • Shows why the question(s) to be addressed are important
			Precise and well-organized explanation of how the answer was found including • Assumptions (if appropriate) • definitions of mathematical terms • algebraic (symbolic) support • graphical support • numerical (tabular) support

Wile E. Coyote

Very Good	Good	Poor	Features
			The audience was kept in mind when making explanations/descriptions of the mathematical concepts and solutions.
			Solves each of the problem(s) that were originally asked and there are no obvious errors in the solution(s).
			Shows understanding of the mathematical concepts and their appropriate use.
			Complete use of graph mechanics including: • labeled axes with units • labeled axis divisions • descriptive title • clear and descriptive legend • data points shown
			Concluding paragraph summarizes the purpose of the project and the outcome. Briefly closes the letter by stating any limitations or suggestions for improvement.
			Style and readability demonstrates a quality of imagination and rigor that results in a distinctive project. The project shows a personal exploration and is creative/original.

Comments on quality of submitted work and how any problems might be resolved in future projects

Results of Assessment

50	**45**	**40**	**35**	**30**	**50 -** All Very Good's **45 -** At least 3 Very Good's and no Poor's **40 -** At least 2 Very Good and no Poor's **35 -** All Good's **30 -** At least 3 Good's **0 -** All Poor's