CALCULUS I

2nd Partial Project

APPLICATIONS OF MOTION: POSITION, VELOCITY AND ACCELERATION.

Introduction: One of the main competencies to develop throughout this course is to represent data from real life situations in a mathematical way using tables, graphs, diagrams and/or equations. In this project you will use what you have learned to model situations using graphs and equations.

1) You will work in teams of no more than four students to solve the tasks involved in this project. Remember that working with a team implies that everyone in the team cooperates to find the best solution and it does not mean to split the work in parts that when presented on the project do not seem to belong together.

2) It is also important to remember that every report should start with an **introduction** where you introduce the topic (**MOTION: POSITION, VELOCITY AND ACCELERATION**) and you give an idea of the approach and goal(s) of the investigation. Do not forget to include your references for this section because that will be graded.

3) The final version of your report must be written in a clear and comprehensible form and it should show the steps (pictures) you followed to solve the situation(s), including procedures, explanations and/or justifications needed, and the results of your investigation, where everything, the process and the results, are completely clear for the reader.

4) The Project will be uploaded in your Portfolio (Geogebra Book).

5) The due date is Tuesday, October, 10th, 2017 before 11:59 pm

PROJECT

6) Consider only **the table that your teacher will assign to your team.**

7) For each of the functions on the table (,,,, ,) build a graph (you can get the graph by using graphmatica with the option Data Plot Editor or any other software). You have to include 6 different graphs (scatter plot).

8) Analyze the behavior of each graph and define the type of function that belongs to each one, justify your choices clearly according to the pattern on the graph and main characteristics of the function that you are choosing.

9) Use the information (values) from the table of position to establish the specific **equation of Position** that matches each one.

10) Using the equation of position that you found previously for each graph, find the **equation of velocity** and the **equation of acceleration** for each graph. Remember to include your procedures.

GENERAL INFORMATION

11) Make sure to deliver your project using your Portfolio (Geogebra Book).

12) Your final report must include cover page, bibliography and final conclusions of each member of the team. The bibliography must include at least one source and should be written using the APA format.

13) Remember that it is very important to include procedures, all of the graphs that were required and any additional graphs that will help you clarify or explain your work, the graphs should include all the details (such as scale, labels, units, etc.) as well as all the explanations and justifications necessary to make your work clear to the reader.

14) The students should be able to:
Know and apply the right mathematical notation and terminology.
Organize and represent the information using tables, graphs and diagrams.
Recognize models and structures in different situations and make generalizations.
Show understanding and knowledge of the mathematical models and use them appropriately.
Recognize the practical applications of mathematics and show full understanding.
Use technological devices as mathematical tools that will contribute to the solution of the given situation.

15) Throughout the project it should be evident that the students:
Have full understanding about the parent functions and the effect (transformations on the graph) that the different parameters have.
Are able to analyze graphs of different functions, recognize the main elements for each and be able to determine the kind of function that belongs to a certain graph.
Are able to analyze certain situation and establish the function that models the situation.
Communicate mathematical ideas in a clear and effective way using the right notation and terminology.
Have developed the ability to work in an honest and responsible form, with high quality, within a team and favoring his/her personal development.

Make sure that you **check the rubrics "Rubric: 2nd partial project"** that would be used to grade this project. The grade that you get by using this rubric will be multiplied by 4 (four) to get your grade in a 100 scale.

=Second Partial Project=

APPLICATIONS OF MOTION: POSITION, VELOCITY AND ACCELERATION.

https://17calculus.com/integrals/linear-motion/

https://www.varsitytutors.com/calculus_1-help/how-to-find-position

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CUAL ES LA TABLE?????

LA E :) ---a lae dd

Calculus is the wide range area of mathematics dealing with topics at instantaneous rates of change, areas under curves, and sequences and series. We will analyze the situation when a function represents the position of an object, in two dimension motions, vertically, horizontally or a combination. When we have a position function, the first two derivatives have specific meanings. The first derivative is the velocity and the second derivative is the acceleration of the object. We take the derivative with respect to the independent variable, t.

About Position

The total displacement is defined as the final position minus the initial position. When we have a position function, the first two derivatives have specific meanings. The first derivative is the velocity and the second derivative is the acceleration of the object. We take the derivative with respect to the independent variable, t.

About Velocity

There is a difference between velocity and speed. Velocity can be negative and includes direction information. Speed is the magnitude of velocity and is always positive. Speed does not include direction. If you are familiar with vectors, velocity is a vector, speed is a scalar whose value is the magnitude of a velocity vector.

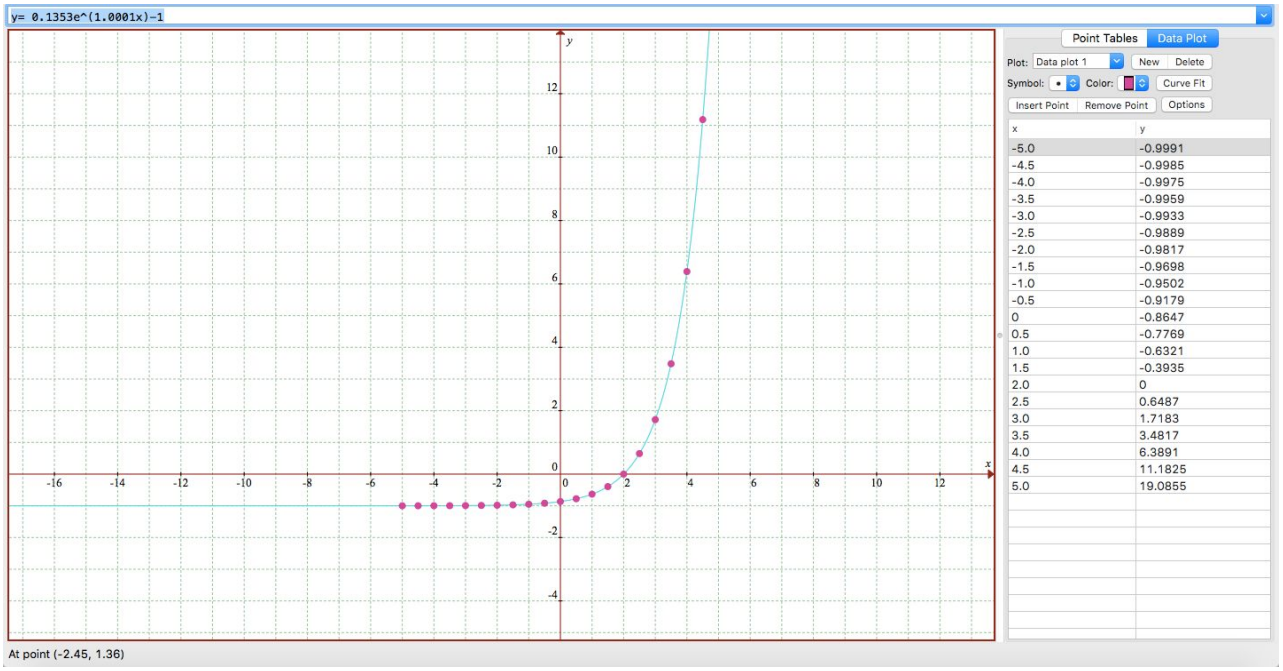
About Acceleration

We assumed acceleration is constant. This is true in many problems, especially ones where we talk about the acceleration due to gravity near the surface of the earth, for example. However, this is not true in ALL problems. So you need to pay attention to what is going on in the problem statement if you are required to set up these equations.

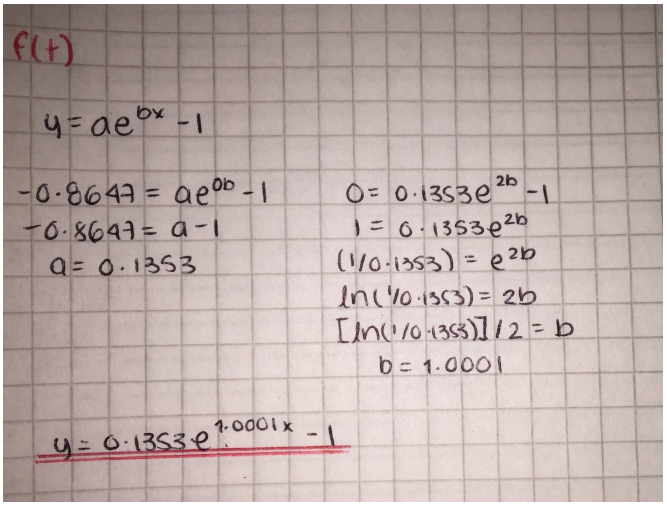
TABLE E

→ f(t) = 0.1353e^(1.0001x)

Graph



Procedure



Analysis

It is an exponential function, it has an asymptote at (-1), since it is positive its values go to positive infinity.

Equation of Position

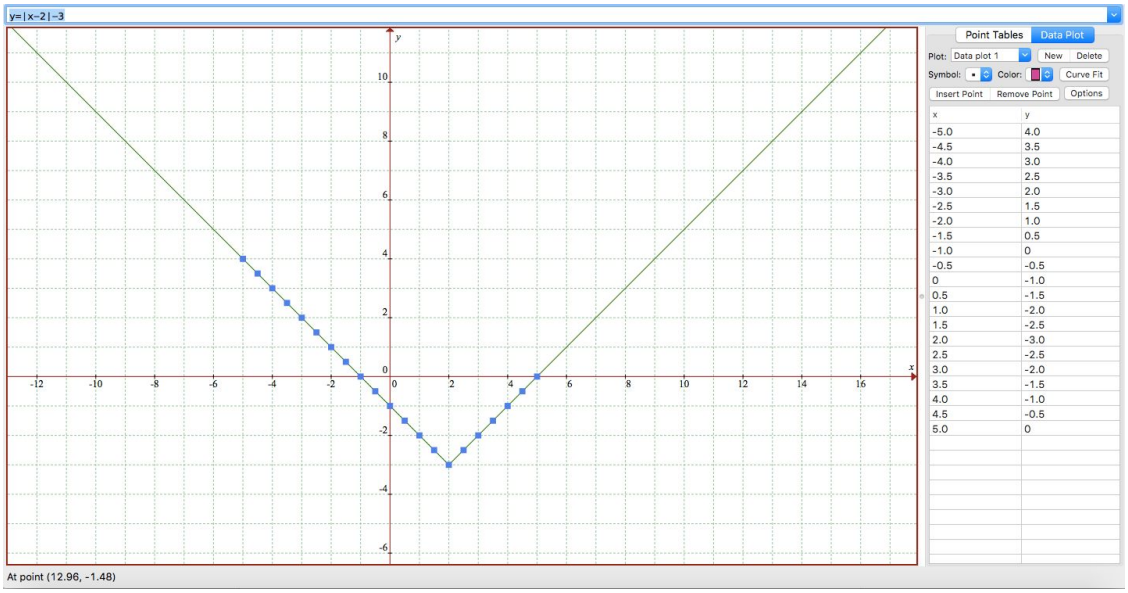
f(t) = 0.1353e^(1.0001x)

Equation of Velocity

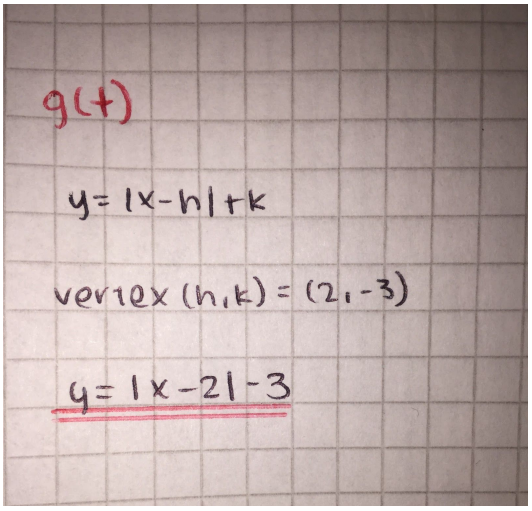
Equation of Acceleration

→ g(t) = |-x+2|- 3

Graph



Procedure



Analysis

It is an absolute value function, its vertex is at (2,-3). Since it is an absolute value function, its minimum value is the vertex and all of the other values are greater than that.

Equation of Position

g**(t) = |-x+2|- 3**

Equation of Velocity

Equation of Acceleration