Math is

$f(u)^n$

SECOND PARTIAL PROJECT

''Derivatives and graphs''

TABLE

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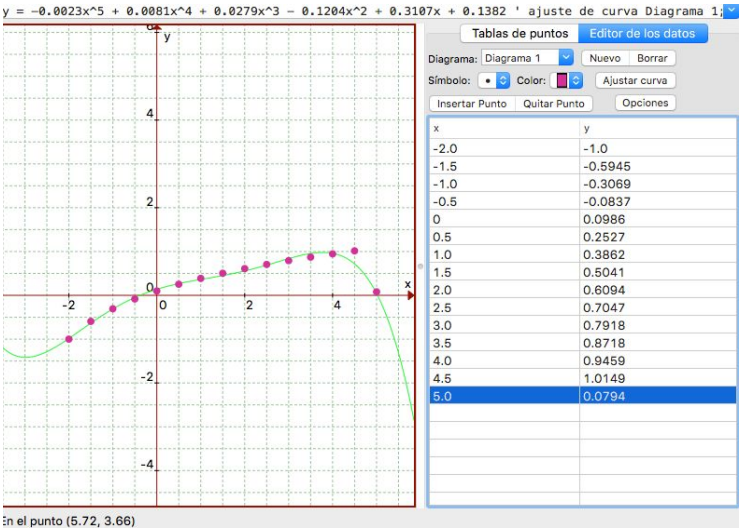
Graphs were made with desmos as a tool, and used Graphmatica to obtain the equations of each graph.

Introduction

Functions are very useful, while using derivative we can find the slope. In Physics we can find the equations for velocity and acceleration with the derivatives. Having the equation for position the slope of the same equation (derivative) is the equation for velocity. Same applies to the velocity equation the slope of the same equation (derivative) gives you acceleration. During this project we can analyze how this behavior works

F(T)CUBIC FUNCTION

The graph is a cubic function, the equation we got is expressed to the fifth power because of the software we used, but originally a cubic function must be in a $y = x^{\wedge 3}$ form.



Equation: $y = -0.0023x^{\wedge 5} + 0.0081x^{\wedge 4} + 0.0279x^{\wedge 3} - 0.1204x^{\wedge 2} + 0.3107x + 0.1382$

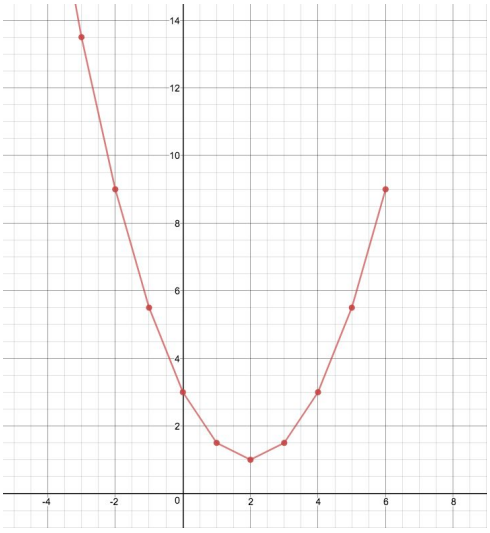
Velocity: $y = 0.0115x^{\wedge 4} + 0.0324^{\wedge 3} + 0.0837x^{\wedge 2} - 0.2408x + 0.3107$

Acceleration: $y = 0.046x^{\wedge 3} + 0.0972x^{\wedge 2} - 0.2408$

G(t) Quadratic Equation Graph

This graph is a parabola meaning it is a quadratic equation a common parabola has the “vertex” on another point as it has a different behavior and values.

x_1	y_1
−4	19
−3	13.5
−2	9
−1	5.5
0	3
1	1.5
2	1
3	1.5
4	3
5	5.5
6	9



Equation: $y = 0.5^{\wedge 2} - 2.0x + 3.0$

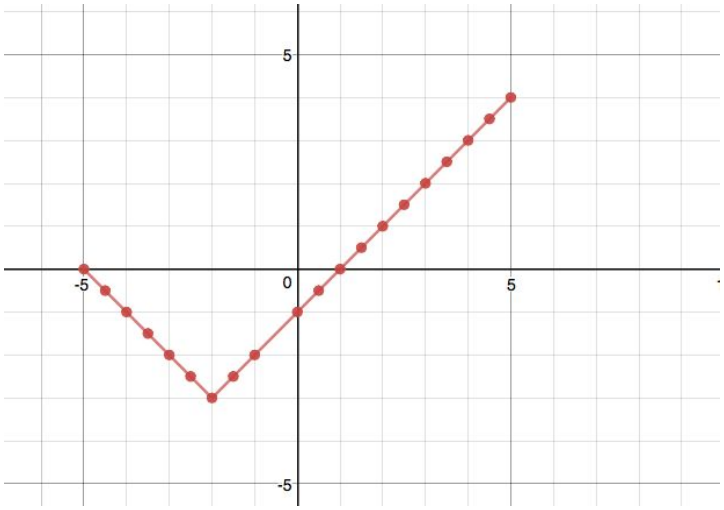
Velocity: $y = x - 2.0$

Acceleration: $y = 1$

h(t) Absolute Value

As well as most of the other functions we managed to understand the type of graph with the shape, and then found the equation of the graph with a software such as graphmatica

x_1	y_1
−5	0
−4.5	−0.5
−4	−1
−3.5	−1.5
−3	−2
−2.5	−2.5
−2	−3
−1.5	−2.5
−1	−2
0	−1
0.5	−0.5
1	0
1.5	0.5
2	1



Equation: $y = 0.0216x^{\wedge 2} + 0.0216x + 1.3343$

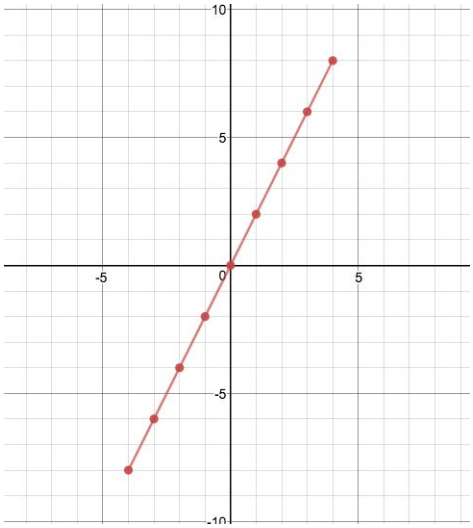
Velocity: $y = 0.0432x + 0.0216$

Acceleration: $y = 0.0432$

F(t) Linear Function

This is a very common graph as it is the most basic it is easy to find the change in this graph as it is the derivative, meaning the slope of the function is 2, change in the graph will be rise over run, two over one.

x_1	y_1
−4	−8
−3	−6
−2	−4
−1	−2
0	0
1	2
2	4
3	6
4	8

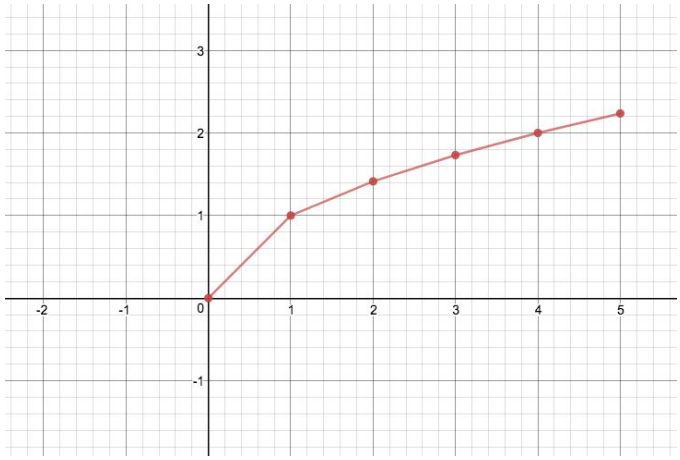


Equation: $y = 2.0x$
Velocity: $y = 2.0$
Acceleration: $y = 0$

G(t) Square Root

We knew this was a square root function as the values given were from 0 or higher and when the points were plotted the shape looked like a common square root function.

x_1	y_1
0	0
1	1
2	1.414214
3	1.732051
4	2
5	2.236068



Equation:

$y = 0.0018x^{\wedge 4} + 0.0069x^{\wedge 3} - 0.2112x^{\wedge 2} + 1.0991x + 0.0277$

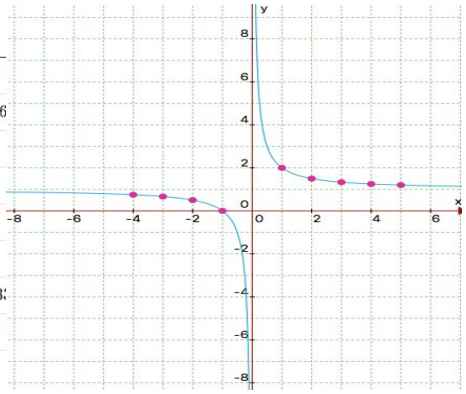
Velocity: $y = 0.0072^{\wedge} x^{3} + 0.2017x^{\wedge 2} - 0.2112x + 1.0991$

Acceleration: y = $0.0216\,x^{2}$ + 0.4034x - 0.2112

H(t) Rational Graph

This graph works as a common rational graph with asymptotes at x = 0 and y = 1 this means values will get closer to this two asymptotes but will never reach it.

x_1	y_1
−4	0.75
−3	0.6666
−2	.5
−1	0
1	2
2	1.5
3	1.3333
4	1.25
5	1.2



Equation: $y = \frac{1}{x} - 1$

Velocity: y = 1

Acceleration: $y = 0$

CONCLUSION #1

In this project we were forced to use a graphing software in order plot and get the equation of a set of data. By this, we observed that 'Graphmatica' gave us functions differently than if we'd got the data manually, this is, because it is a different way of writing the same function. We learned that in order to see the accuracy of the graph we needed to verify that R^2 was a number very close to 1… the closer, the more accurate it was.

CONCLUSION #2

By doing this project, we needed to analyze graphs and their behavior. By doing this, we had to check what type of equation it was. We researched about the types of graphs, their translations, and how they behaved.
In this project we also used multiple amounts of graphing softwares, such as: Desmos, mathway, graphmatica and excel; this softwares helped us to do our project and fulfill our graph investigation.

References

- GRAPHMATICA (n.d.). Retrieved October 10, 2017, from http://www.graphmatica.com/index.html/Fespanol/2F
- Mathway (n.d.). Retrieved October 10, 2017, from https://www.mathway.com/Algebra
- Desmos. (n.d.). Retrieved October 10, 2017, from https://www.desmos.com/