Calculus 2nd partial project

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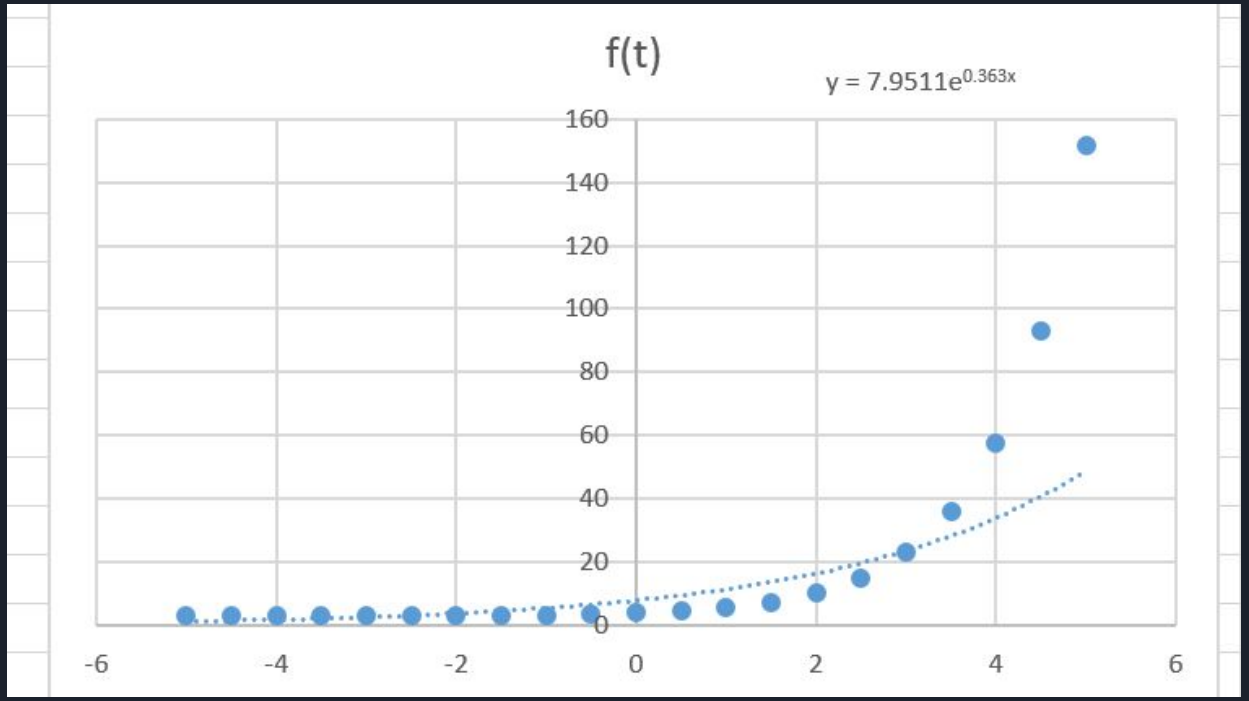
Introduction

Position, velocity, and acceleration all describe the motion of an object and are vector quantities. Position is given as a function of x with respect to time, x(t). An object's change in position with respect to time is known as its displacement. The velocity of an object is found by taking the derivative of the position function: $v(t)=x'(t)$. Velocity can be thought of as the object's speed and direction, or change in position over time. The acceleration of an object is equal to the derivative of its velocity $a(t)=v'(t)=x''(t)$ and describes the object's change in velocity over time.

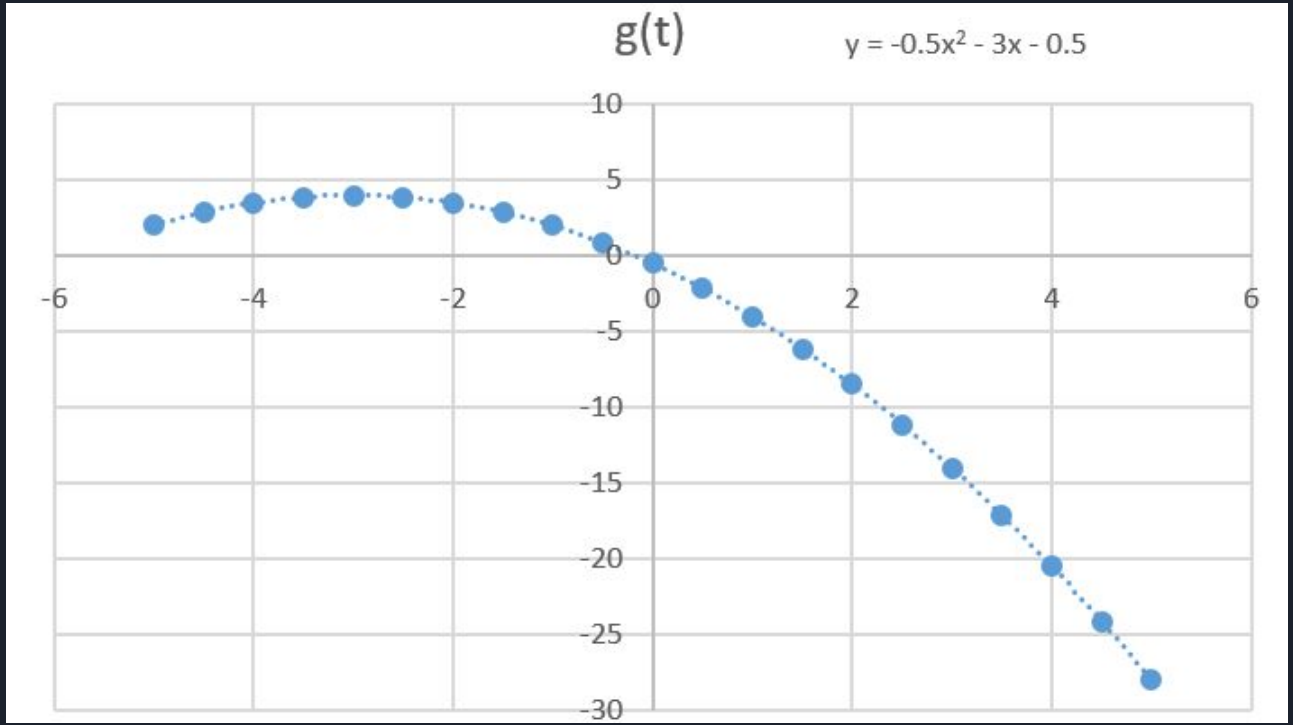
Graphs



Type of function:
Exponential

+ Exponential functions have the form of an horizontal “J”

$$y = 20.08554e^{(x-3)} + 3$$

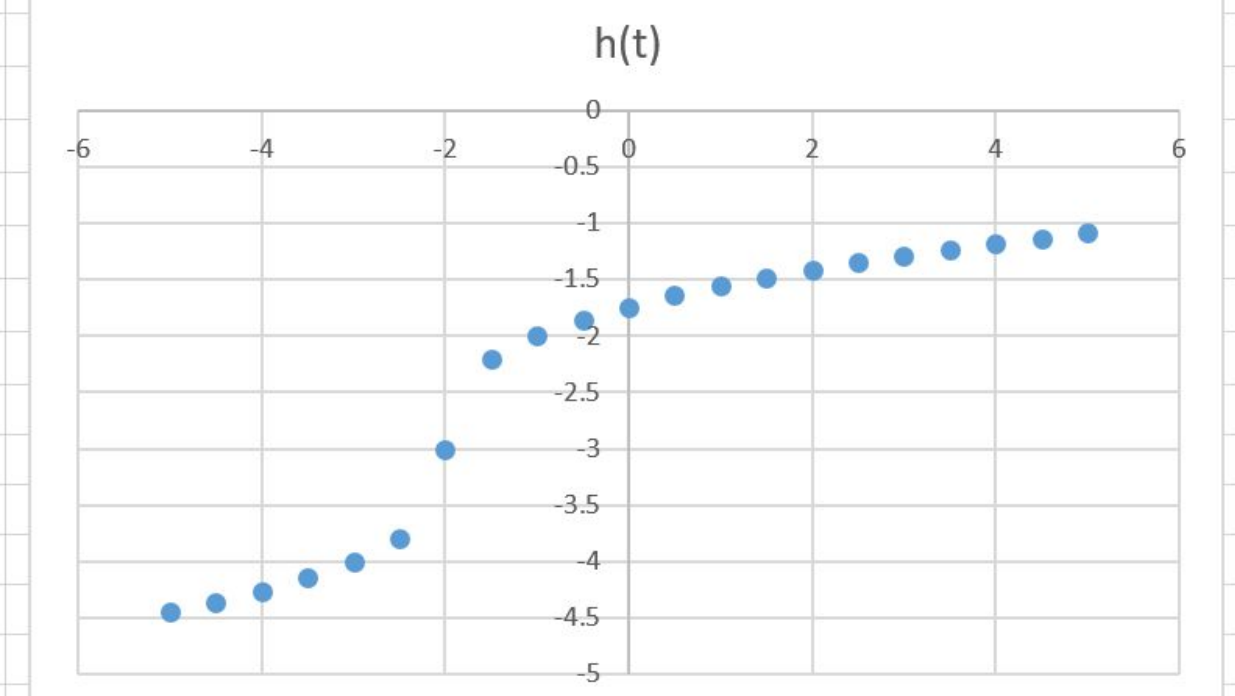


Type of function:

Polynomial

+This is a polynomial function because of its form

$$y = -0.5x^2 - 3x - 0.5$$

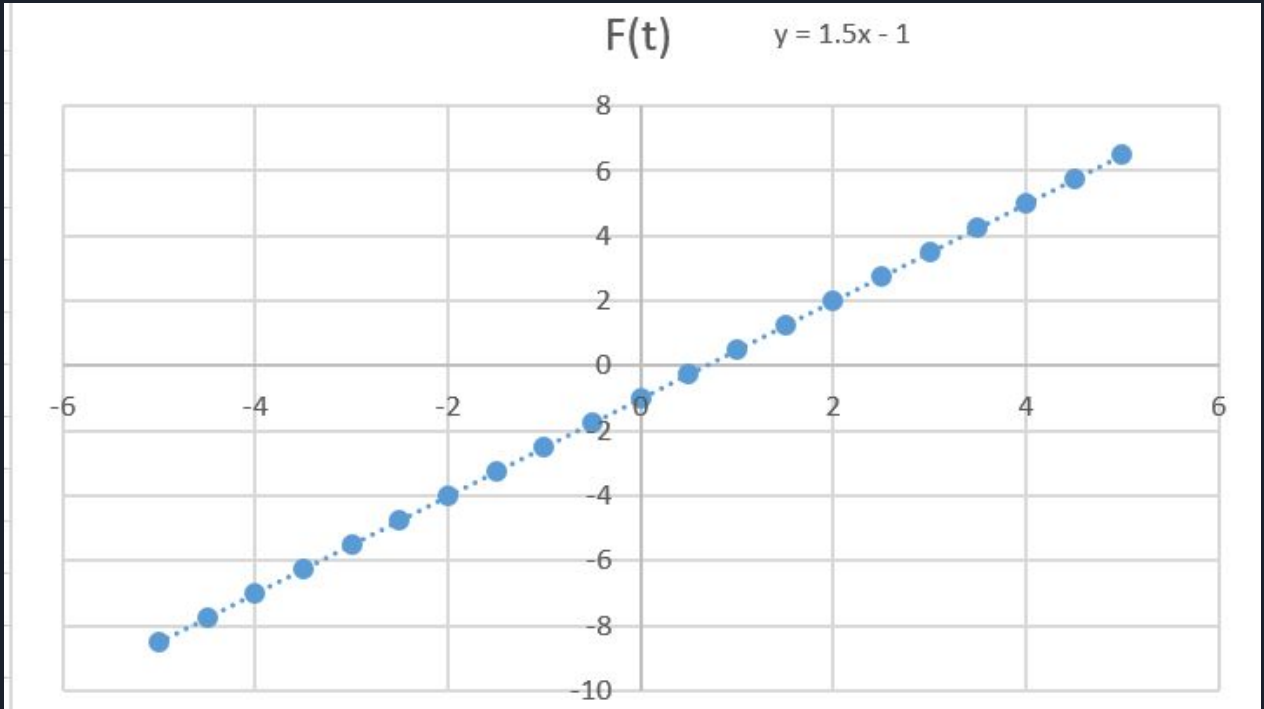


Type of function:

Cubic root

+Cubic root graphs have a characteristic form of an horizontal “*S*”

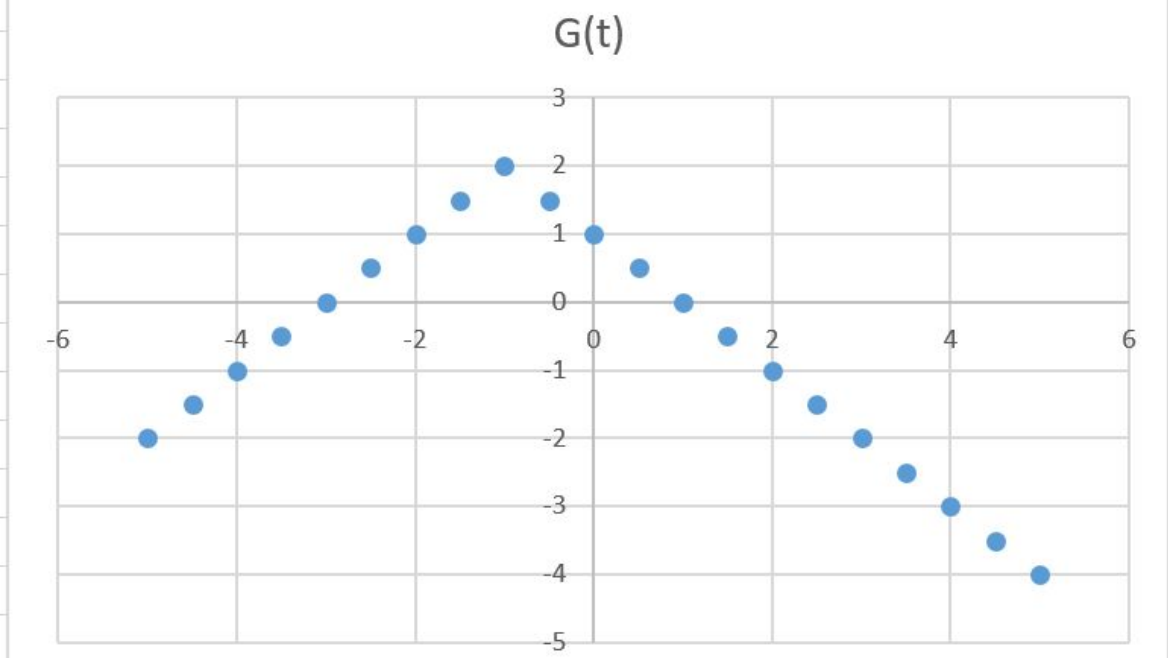
$$y = \sqrt[3]{(x+2)} - 3$$



Type of function:
Linear

+Linear functions are straight lines on the graph.

$$y = 1.5x - 1$$

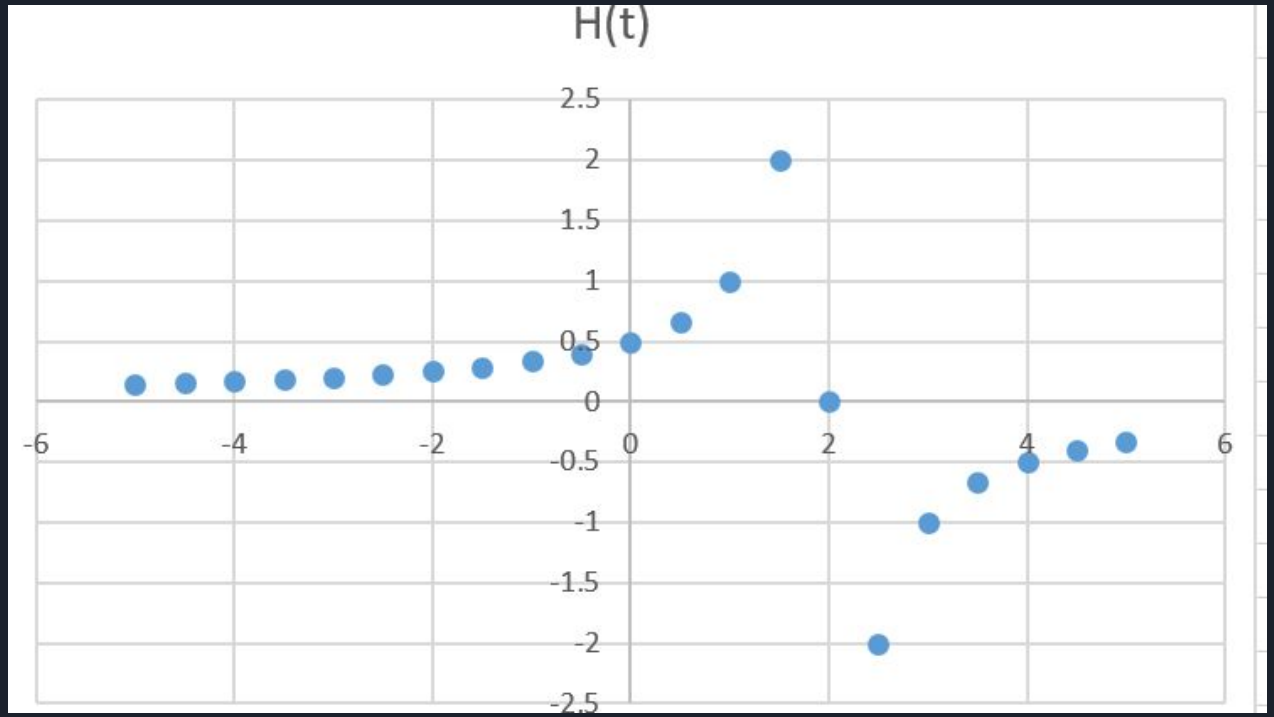


Type of function:

Absolute value

+We identified it because the “V” shape on a graph is characteristic of absolute value function graphs

$$G(t) = -|t+1| + 2$$



Type of function: Rational

+We identified it because one of the main characteristics of rational functions is the existence of asymptotes and here we can appreciate both vertical and horizontal asymptotes

$$y = -\frac{1}{x-2}$$

Equations

$f(t) = 20.08554e^{(x-3)}+3$

$g(t) = -0.5x^2-3x-0.5$

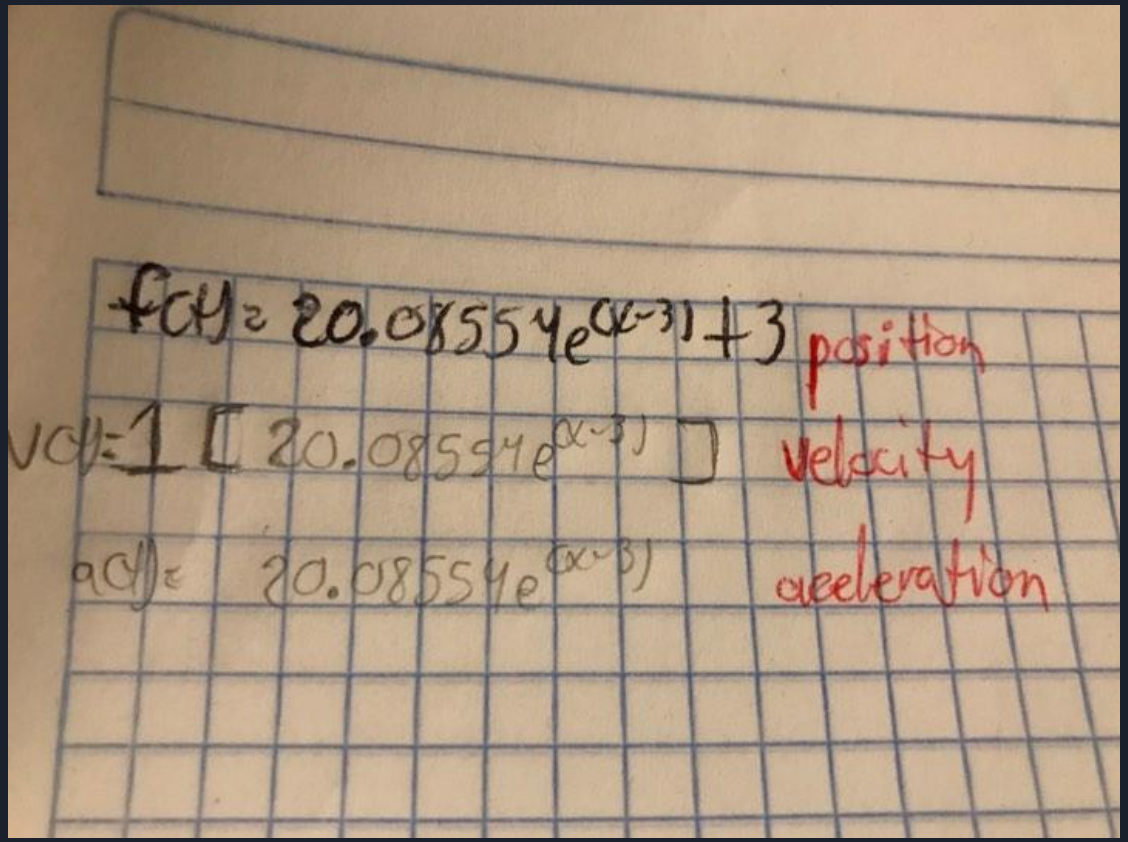
$h(t) = \sqrt[3]{(x+2)} -3$

$F(t) = 1.5x-1$

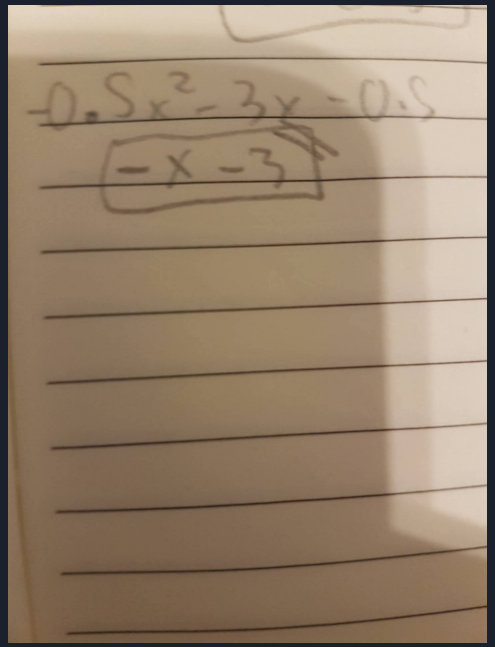
$G(t) = - |t+1|+2$

$H(t) = - 1/x-2$

$f(t) = 20.08554e^{(x-3)}+3$



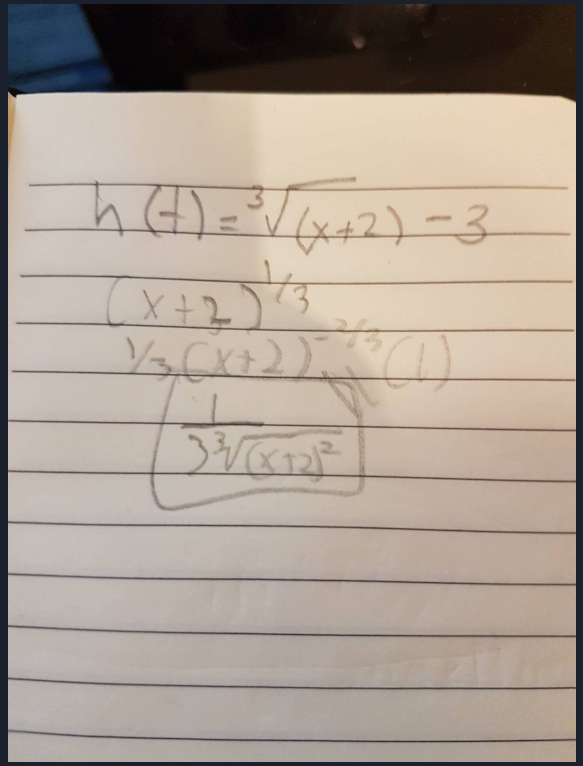
$g(t) = -0.5x^2 - 3x - 0.5$



Velocity: 1x-3

Acceleration: -1

$h(t) = \sqrt[3]{(x+2)} - 3$



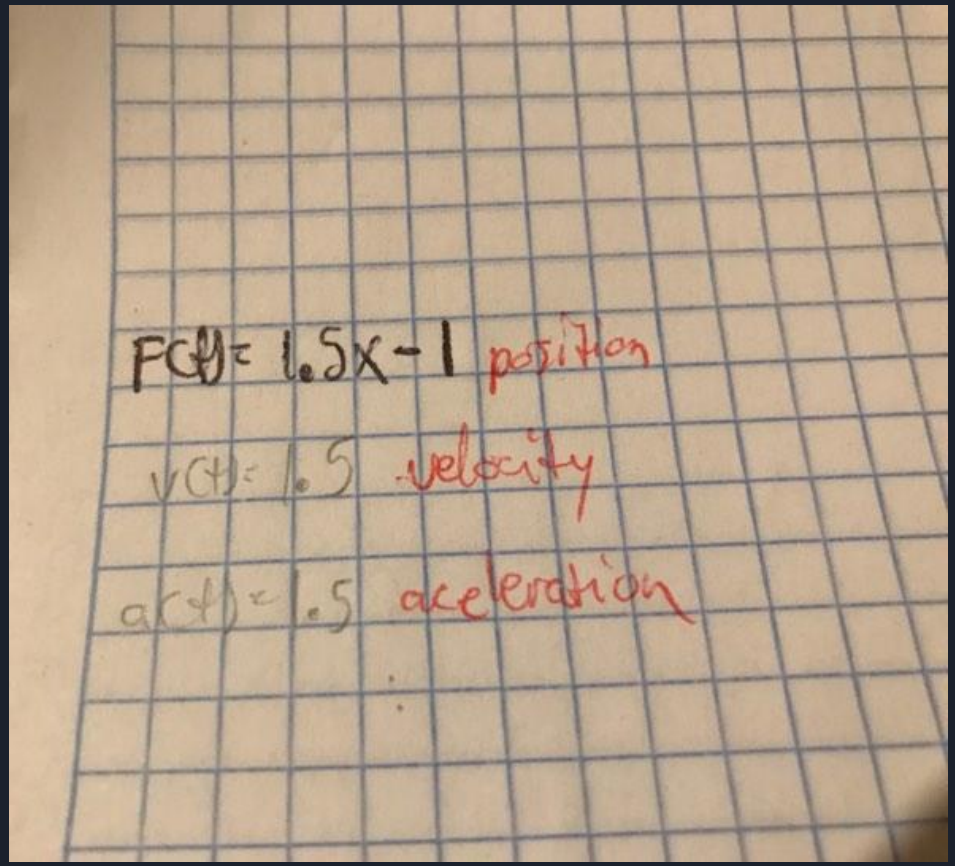
Velocity:

⅓(x+2)^2/3

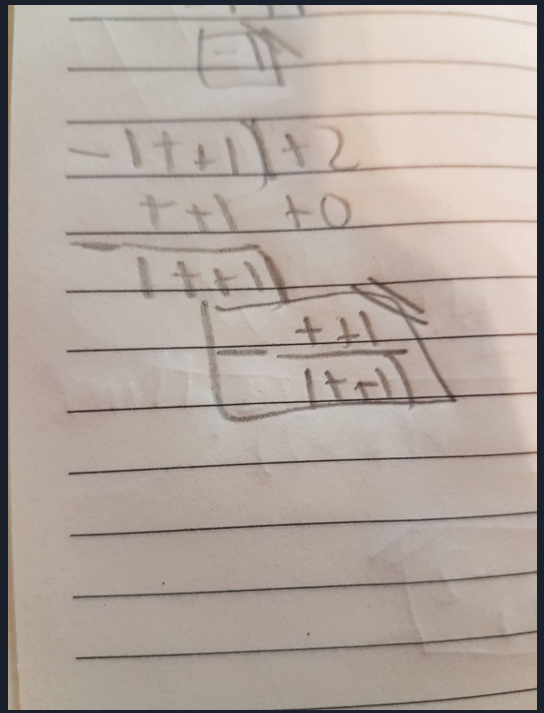
Acceleration:

1

F(t)= 1.5x-1



G(t)= - |t+1|+2



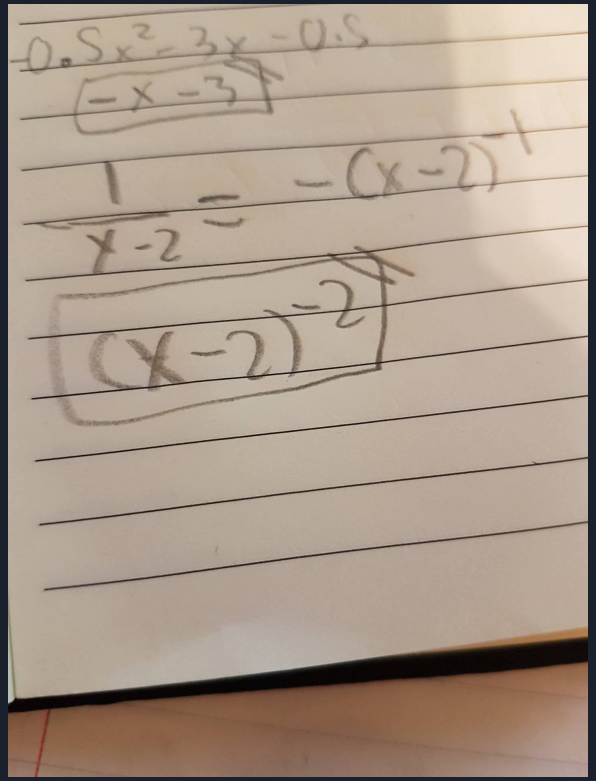
Velocidad:

-(t+1)/[t+1]

Acceleration:

1

H(t)= - 1/x-2



Velocidad:

1/(x+2)^2

Acceleration:

1

Conclusion

It can be concluded that graphs behavior depends on the number on the side of the “x”, which is the the value that is constantly changing, graphs also can change due to the way the equation is arranged and the signs it has. -Roly

The transformations on the graph for each function is done very differently, but they all carry a unique “form”, therefore you can identify the type of function and graph to get an idea of how the graph is going to look like. This project helped us to identify them and understand them better. - Betty

In conclusion each graph can be seen differently depending on the values . While the values on x are the same since the time is independent and it is always increasing, the y values are the ones that give the different forms of each graph. Each value in y affects how the graph behaves and works. -Deme

As the graphs were done, each of them were behaving different depending on the values given (x), and that’s how we were able to understand the changes in the graphics and how to get the velocity, acceleration and position from there, very useful. -Lucy

Bibliography

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