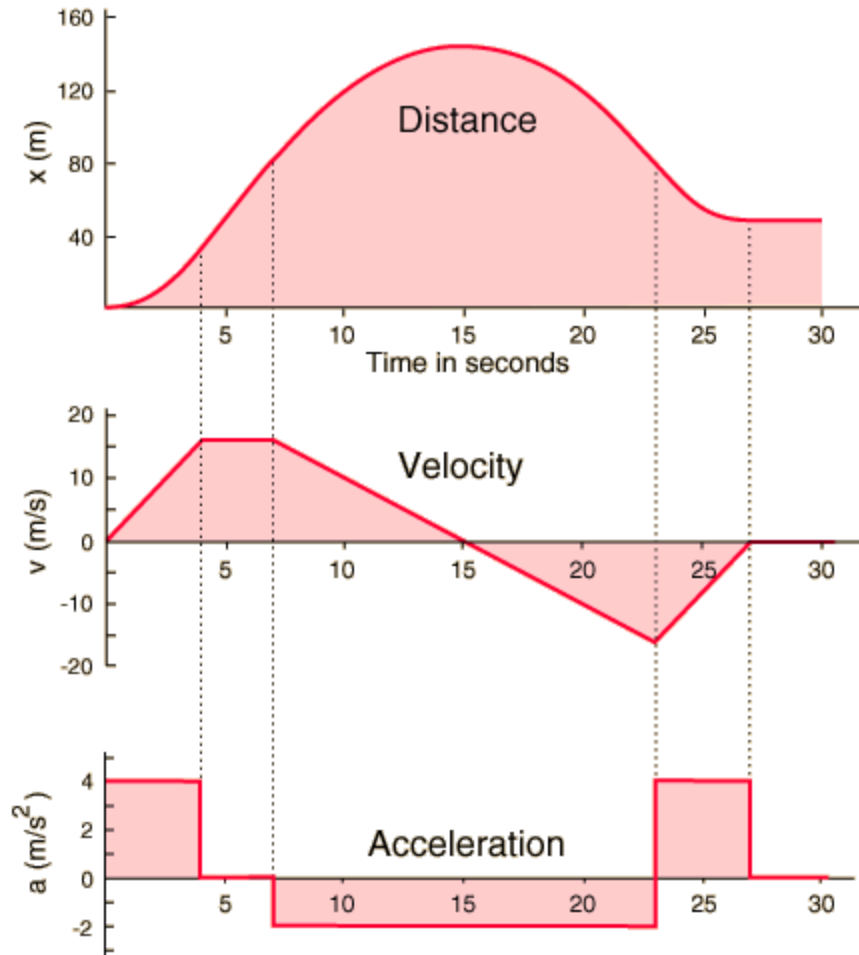


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Prepa Tec Campus Cumbres
CALCULUS I
2nd Partial Project
APPLICATIONS OF MOTION: POSITION, VELOCITY AND ACCELERATION.



Introduction

Motion: is the process of something moving or changing place, or even just changing position.

Position: the comparison of where something is with respect to another object or its surrounding.

Velocity: A vector in which its magnitude is speed and its direction is where the body is moving to.

Acceleration: The increase or constant of speed of the object or body over time.

Objective:

To analyze and recognize the main characteristics of a graph. We must be able to recognize what type of equation it represents and what the exact equation is.

Table f(t):

-Exponential Equation

$-y = 2^{x-2} - 1$ Velocity: $2^{x-2} \ln 2$ Acceleration: $2^{x-2} \ln^2(2)$

-There is a horizontal asymptote in -1 , so it must be an exponential function.

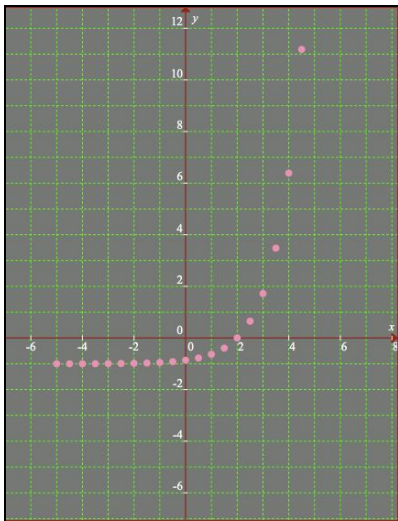


Table g(t):

-Absolute Value Equation, I thought this was an Absolute Value equation because of the "v" figure that the dots form and that is how a Absolute Value look when you graph it.

$-y = |x-2| - 3$ when $-5 \leq x \leq 5$; Velocity = $x-2 / |x-2|$; Acceleration = 0

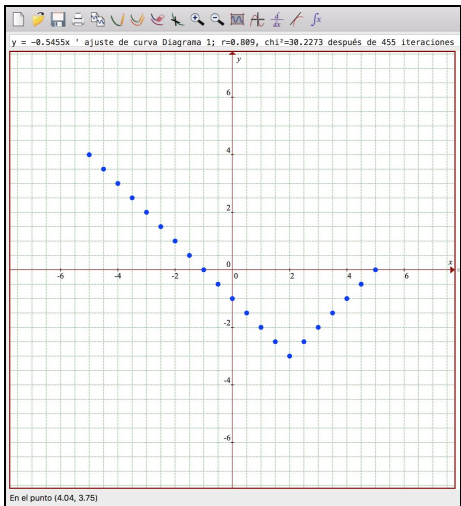


Table h(t)

-Linear Equation

-Formula: $y=2x+5$ Velocity: 2 Acceleration: 0

-It is a linear equation because it is a 1 degree equation.

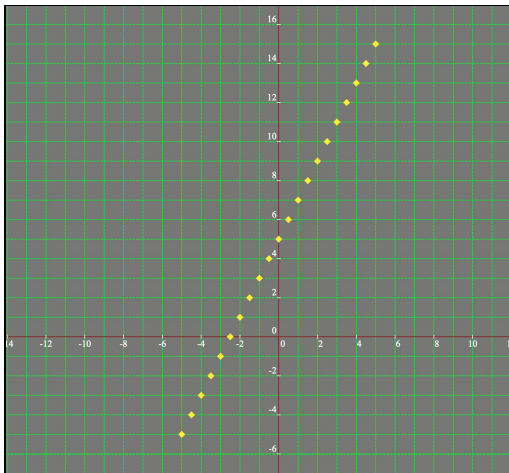


Table F(t):

-Reciprocal Equation

-Formula: $y= ((1/x-1))$ / Velocity: $(-1/x^2)$ / Acceleration: $(2/x^3)$

-There is a vertical asymptote in 1 and a horizontal asymptote in 0, so i assumed it was a reciprocal equation.

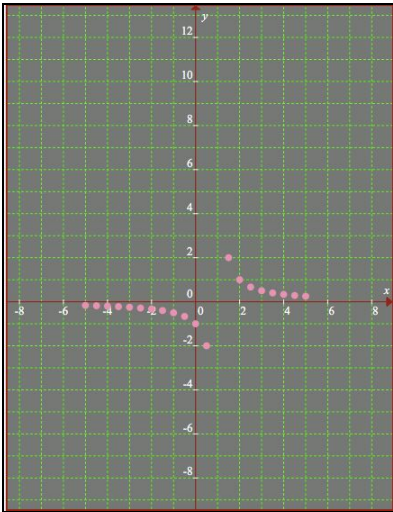


Table G(t):

- $y = (x+2)^2 - 8$; Velocity = $2(x+2)$; Acceleration = 2

-Quadratic Equation, I thought this was an incomplete parabola so that is why I think it's a quadratic function and also because the values of "y" repeat.

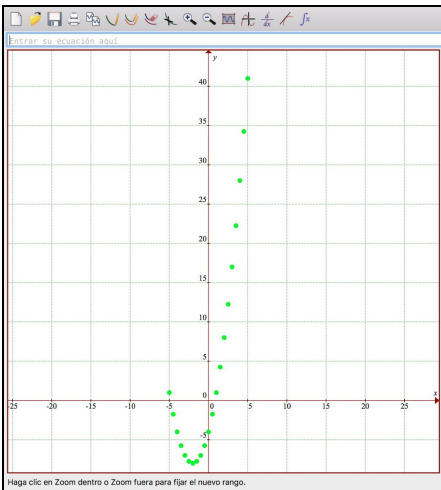
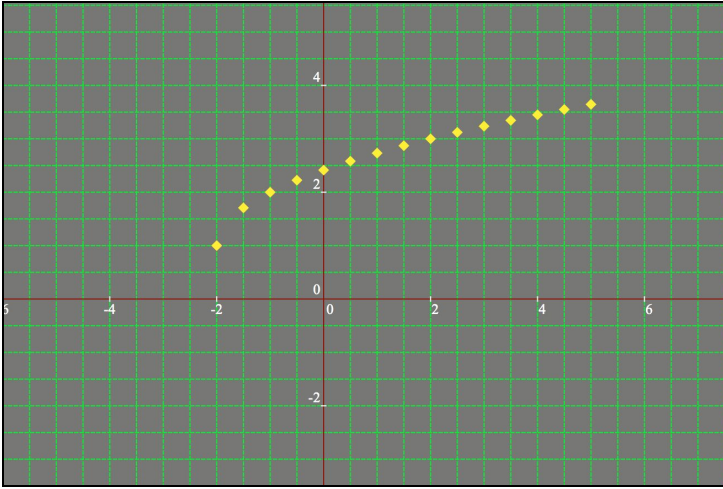


Table H(t)

-Polynomic Equation

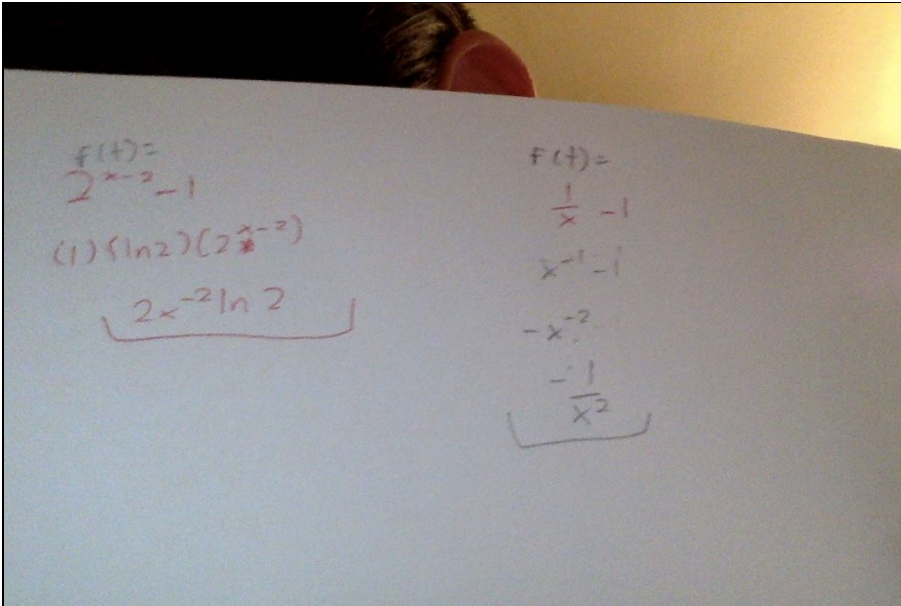
-Formula: $y = -0.0402x^2 + 0.4427x + 2.3388$ Velocity = $(0.804x + 0.4427)$ Acceleration = 0.804

-There is a curve that has an origin point so it is a polynomic equation.



Procedures:

f(t) / F(t)



g(t) / G(t)

$$y = (x+2)^2 - 8$$

$$y' = 2(x+2)(1) = 2(x+2) //$$

$$y'' = (x+2)(0) + (2)(1) = 2 //$$

$$y = |x-2| - 3$$

$$y' = \left(\frac{d}{dx} \frac{1}{|x-2|} \right) \cdot (x-2) = \frac{(1-0) \cdot (x-2)}{|x-2|^2} = \frac{x-2}{|x-2|} //$$

$$y'' = \frac{(1)(|x-2|) - (1)(x-2)}{(x-2)^2} = 0 //$$

$$V' = 1$$

$$U' = 1$$

h(t) / H(t)

$$-0.0102x^2 + 0.4127x + 7.3888$$

$$\frac{-0.0102x^2 + 0.4127x + 7.3888}{-0.804}$$

$$2x + 5$$

$$2$$

$$0$$

Conclusion

Throughout the making of this project we realized that in the formulas of position we can get the derivative of it and if we derivate a second and a third time, we get the equation of velocity and of acceleration. Knowing how to get them is an useful tool because with derivatives we can get slopes, velocity, and acceleration formulas that are also very commonly used and needed for our physics class. This project also made us remember and put in practice all of our graphing knowledge

acquired throughout all of our past semesters in Prepa Tec Campus Cumbres.

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