

Lab 1

Motion diagrams

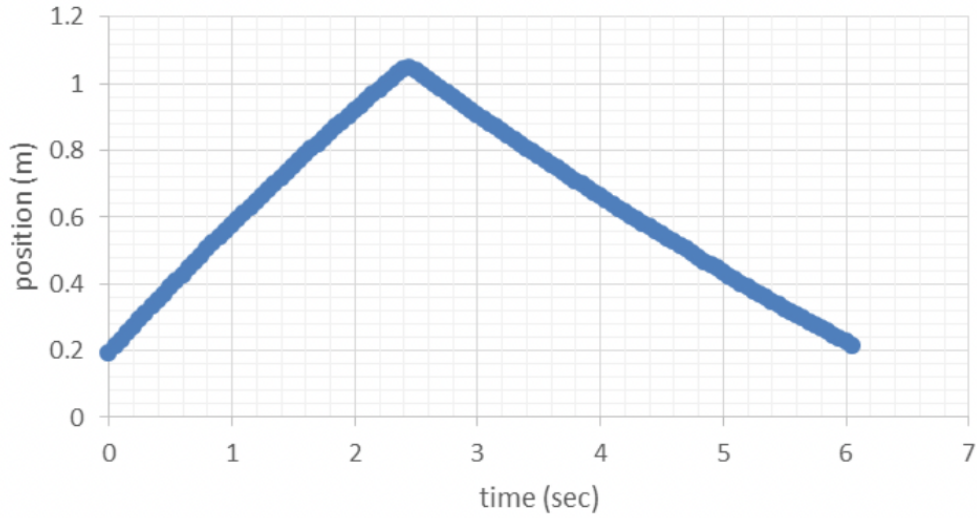
Rectangle Repulsed Researchers

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Part 3: Matching Position vs. Time and Velocity vs. Time Graphs

Graph 1



Graph analysis

Graph one depicts a the position vs time graph of an object in a colison.

Graph 1 shows a graph of a collision. The object's distance from the sensor is increasing. The slope of the position is velocity so we can also say that the velocity is positive and constant. Then at $t \approx 2.4s$ its position begins decreasing at a constant, negative velocity.

$$\frac{d}{dx}[s(t)] = v_{x_1} = 0.35m/s V_{x_2} = -0.35m/s \quad (1)$$

Setup

Our setup consisted as a flat track with a magnetic bumper 60cm from the the *PASCO Universal 850 interface and Motion Sensor II*. We pushed and released the cart towards the bumper. We consider friction and drag negligible.

Graph 2:

Graph discription:

Graph 2 depicts an object speeding up at a constant rate. We know this because the object's position is increasing and the velocity is positive and increasing.

Setup:

Our setup consisted of a track at an downward incline. We released the cart from the top of the track and let it slide to the bottom. We consider friction and drag negligible.

Graph 3:

Graph discription:

Graph 3 depicts an object in freefall that hits the ground and stays there. We know this because the object's position starts from an increased height

Setup:

Our setup consisted of a the sensor positioned updward. We dropped a large beach ball.

Graph 4:

Graph discription:

Graph 4 depicts an object moving down an incline. It comes in contact with somethinhg at the bottom and changes direction.

As it changes direction it slows down. Then at $t = 2.6s$ its velocity becomes negative but the acceleration stays positive where it is slowing down

Setup:

Our setup consisted of a the sensor positioned at the bottom of an incline plane. We released the cart from the top

Graph 5:

Graph description:

Graph 5 depicts an object that starts from rest then is that is pushed then slows to a stop. We know this because the graph depicts the initial velocity as 0m/s, then the velocity rapidly increases and the acceleration is positive. At the acceleration goes to zero and the velocity is constant

Setup:

Our setup consisted a flat plane and we pushed the cart away from the sensor

Graph 6:

Graph description:

Graph 6 depicts an object which is pushed and released up a hill. Eventually gravity slows it down and it returns down the hill

Setup:

Our setup consisted of a incline plane. We gave the cart a push and let it go up the hill then return down

Graph 6:

Graph description:

Graph 6 depicts an object moving up and shown on a spring.

Setup:

Our setup consisted of an downward incline. The bumper was positioned 60cm away from the sensor.