Work Sheet

Student Name: _____

Team members:
1.- _____ 2.- _____

3.- _____ 4.- _____

Instructor: _____

Note: *Please attach your plots for the analysis of each experiment.*

Introduction

Analysis

Given the spark frequency used in the experiments, what is the time between each consecutive mark and what is the time between each indexed point? Be sure to label them clearly."

Experiment 1:

1. Calculate the average puck's speed, v_{px}, in meters per second between every two consecutive puck's marks. Give an example of this calculation in the space below. Then, use your formulas to do the calculations on a spreadsheet for all your data.

2. Make scatter plot of v_{px} using time as the horizontal variable. Given the spread of points, does it makes sense to calculate an average speed? Or does it look like the puck is accelerating? Explain.

Experiment 2:

1. Calculate the average puck's velocities, v_{py}, in meters per second between every two consecutive puck's marks. Give an example of this calculation in the space below. Then, use your formulas to do the calculations on a spreadsheet for all your data.

2. Using time as the horizontal axis, make a scatter plot of v_{py}. Based on your plot, how much is the speed changing with time? Explain.

3. What is the acceleration of the puck.

Experiment 3:

1. Calculate the average velocity components of the puck, v_{px}, and v_{py} in meters per second between every two consecutive puck's marks. Give an example of this calculation in the space below. Then, uses your formulas to do the calculations on a spreadsheet for all your data.

2. Using time as the horizontal axis, make a scatter plot of v_{px}. Based on your plot, how much is this component of the velocity changing with time? Explain.

3. Using time as the horizontal axis, make a scatter plot of v_{py}. Based on your plot, how much is this component of the velocity changing with time? Explain.

4. What is the acceleration of the puck in this case?

5. Compare, by relative percent difference, the difference in accelerations along the y-axis between experiments 3 and 2.

6. Compare, by relative percent difference, the difference in accelerations along the x-axis between experiments 3 and 1.

Conclusion

(Write a short paragraph to explain what you have learned from the experiments. In particular, tell us if you find any evidence showing that velocity is related to changes in position and that acceleration is related to the changes in velocity? Refer to your plots as needed.)