P1310L, Kinematics
Lab 2, Work Sheet

Submitted by: _____ Experiment's date: _____

Team members:

1.- _____ 2.- _____

3.- _____ 4.- _____

Introduction

Write a short paragraph about the purpose of this lab.

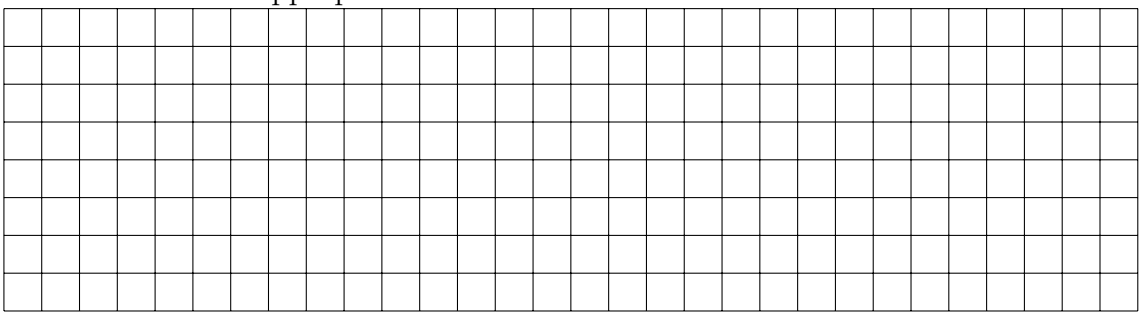
Analysis

Given the spark frequency used in the experiments, what is the time between each consecutive marks 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. The plot axes must include labels with appropriate SI units.



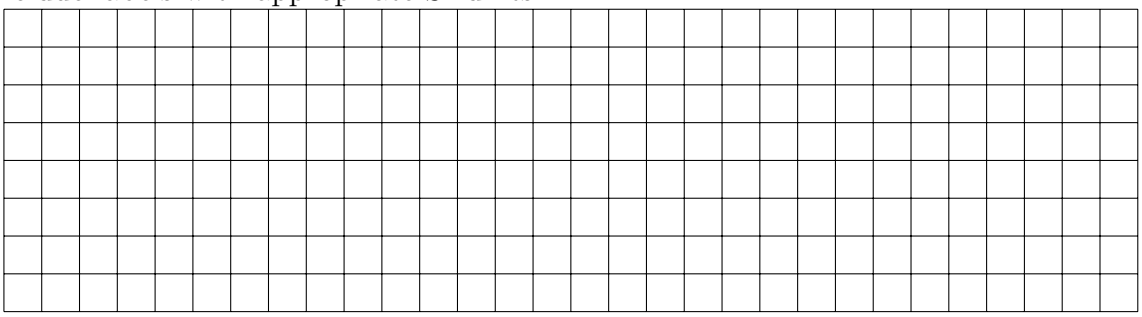
3. Given the spread of points, does it makes sense to calculate an average speed? Explain.

4. If an average is appropriate, what is the average puck's speed?

Experiment 2:

5. Calculate the 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.

6. Using time as the horizontal axis, make a scatter plot of v_{py}. The plot axes must include labels with appropriate SI units.



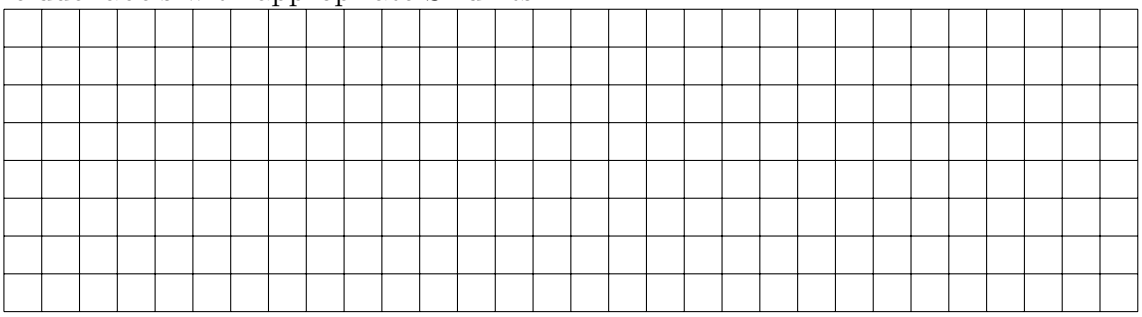
7. Based on your plot, is the speed changing with time? Explain.

8. What is the acceleration of the puck.

Experiment 3:

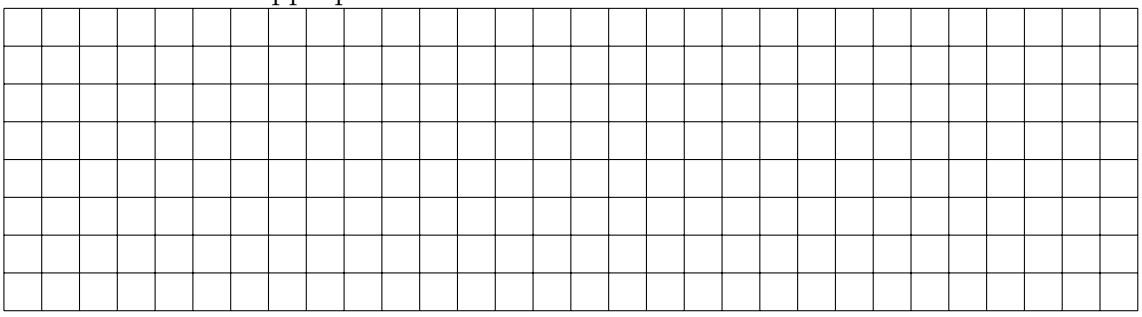
9. Calculate the velocity components of the puck, v_{px}, and v_{py} in meters per second between every two consecutive puck's marks. Give an example of this calculation in the space below. Then, uses your formulas to do the calculations on a spreadsheet for all your data.

10. Using time as the horizontal axis, make a scatter plot of v_{px}. The plot axes must include labels with appropriate SI units.



11. Based on your plot, does it makes sense to calculate an average speed? And if so, what is the average speed?

12. Using time as the horizontal axis, make a scatter plot of v_{py}. The plot axes must include labels with appropriate SI units.



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

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

15. Compare, by relative percent difference, the velocities along the x-axis between experiments 3 and 1.

Conclusion

Summarize your results and write a brief reflection on the experiment; in particular, comment on whether the theory makes reasonable predictions despite the observed variability.