P1310L, Newton's Laws –Part I
Lab 5, 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

Acceleration Along an Air Track

1. Draw the free body diagram for this experiment. Be sure to label the masses and the forces.

2. Use $a_{\text{ideal}} = g\left(\dfrac{m_2}{m_1 + m_2}\right)$ to calculate the theoretical acceleration.

3. Find the percentage error.

4. Use $f = (m_1 + m_2)(a_{\text{ideal}} - a_{\text{measured}})$ to calculate the frictional force. Explain what can cause this frictional force in this experiment.

String Tension Along an Air Track

5. Draw the free body diagram for this experiment. Be sure to label the masses and the forces.

6. Use $a_{\text{ideal}} = g\left(\dfrac{m_2}{m_1 + m_2}\right)$ to calculate the theoretical acceleration.

7. Find the percentage error percentage.

8. Use $f = (m_1 + m_2)(a_{\text{ideal}} - a_{\text{measured}})$ to calculate the frictional force. Explain what can cause this frictional force in this experiment. How is it different compared to the previous experiment?

9. Use $T = m_2(g - a_{\text{measured}})$ to calculate the tension in the string.

10. Find the error percentage for the tension. Why is it different? Explain.

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.

[1] This is an adaption from S. Sugaya's original version