

P1310L, Newton's Laws –Part II

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 Through an Atwood Machine

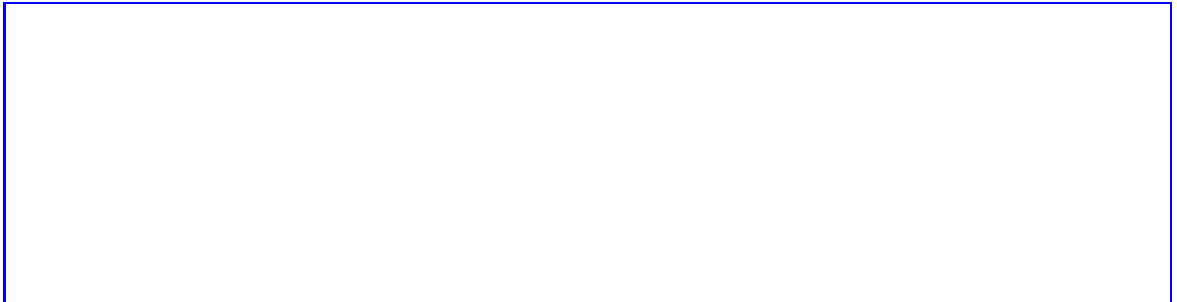
1. Draw the free body diagram for this experiment. Be sure to label the masses and the forces.



2. Use $a = g \left(\frac{m_2 - m_1}{m_2 + m_1} \right)$ to calculate the theoretical acceleration for each trial. Label them clearly!



3. Calculate the error percentage for the each trial. Which error percentage is the lowest and why? Explain.



Static Friction on a Horizontal Surface

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

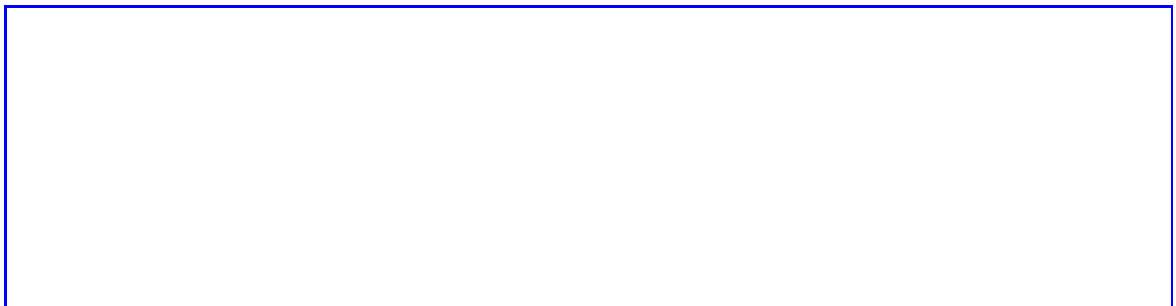


5. Use $\mu_s = \frac{|F_{\text{applied}}|}{mg}$ to calculate the coefficient of the static friction for each material you used. Clearly label them. F_{applied} is the maximum force you recorded.



Kinetic Friction on an inclined surface

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



7. Use $\mu_k = \tan\theta - \left|\frac{a}{g}\right|\sec\theta$ to calculate the coefficient of the kinetic friction between the wooden surface and the inclined surface.



8. Considering the previous experiment, would μ_k change with different surfaces? If so, how?

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.

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