

Physics 106A: Classical Mechanics  
Homework 4: Lagrange multipliers and oscillations

**DUE: Thursday, October 31 2002**

Remember: Late homework will be granted 50% credit up to 1 week late. After that, no credit will be given.

Reading Assignment: Hand and Finch Chapter 3.

1. (*Lagrange Multipliers.*) Consider the double Atwood machine from last week's homework. Setup the problem using Lagrange multipliers, and find the tension in the strings.

2. (*Oscillations*) Consider a simple harmonic oscillator. Calculate the time average kinetic and potential energy over one cycle. Compare them and comment on why the result is reasonable. Calculate the space averages of the same quantities and comment on the result.

4. (*Critical Damping*) Hand and Finch Chapter 3, problem 10