MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Physics Department

Physics 8.01T   Fall Term 2004

Experiment 08: The Physical Pendulum

Section: _____ **Table and Group:** _____

Participants: _____

_____

_____

Each group need turn in only one report. Make sure that you each have a copy of your data, as you will need it for a problem on Problem Set 10. (You can find a copy of the problem at the end of the notes for the experiment.)

Part One: Bare Ruler Pendulum

Enter your data for the three initial amplitudes of the ruler pendulum into the table below.

Displacement	θ_0	**Period**
0.10 m	0.10	
0.25 m	0.25	
0.50 m	0.52	

1. Estimate the error in your measurement of the period T of the pendulum and explain why you made that estimate.

2. The first order correction to the $\sin\theta = \theta$ approximation gives a period $T(\theta_0) = T(0)[1 + \theta_0^2/16]$ where θ_0 is the angular amplitude (in radians) of the pendulum motion and $T(0)$ is the period assuming the approximation is exact. Calculate the correction and compare it to your estimated error.

3. Were you able to detect any evidence of the $\sin\theta = \theta$ approximation breaking down?

Part Two: Ruler With Attached Weight
Enter the results measured by your group for the period when a weight was clipped to the ruler into the table below.

Displacement	Weight	Position	Period
0.20 m	58.6 gm	0.25 m	
0.20 m	58.6 gm	0.50 m	
0.20 m	58.6 gm	0.90 m	