Other Forms of Simple Harmonic Motion

Pre-Class Questions

Problem Set (due next time)
Ch 11 – 44, 45, 47, 48

Lecture Outline

1. The Simple Pendulum
2. The Physical Pendulum
3. The Torsional Pendulum

θ (˚)	θ (rad)	sin θ	% error
30	0.5236	0.5000	4.7%
20	0.3491	0.3420	2.1%
10	0.1745	0.1736	0.52%
5	0.08727	0.08716	0.13%
3	0.05236	0.05234	0.038%
1	0.017453	0.017452	0.0057%

Example 1: Find the length of a pendulum that has a period of 2.00s.

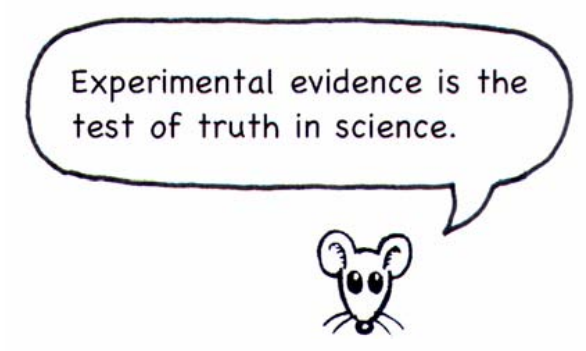
Find the Value of g.

1. Hold your pendulum so that it is one meter long.

2. Measure the time for ten complete oscillations.

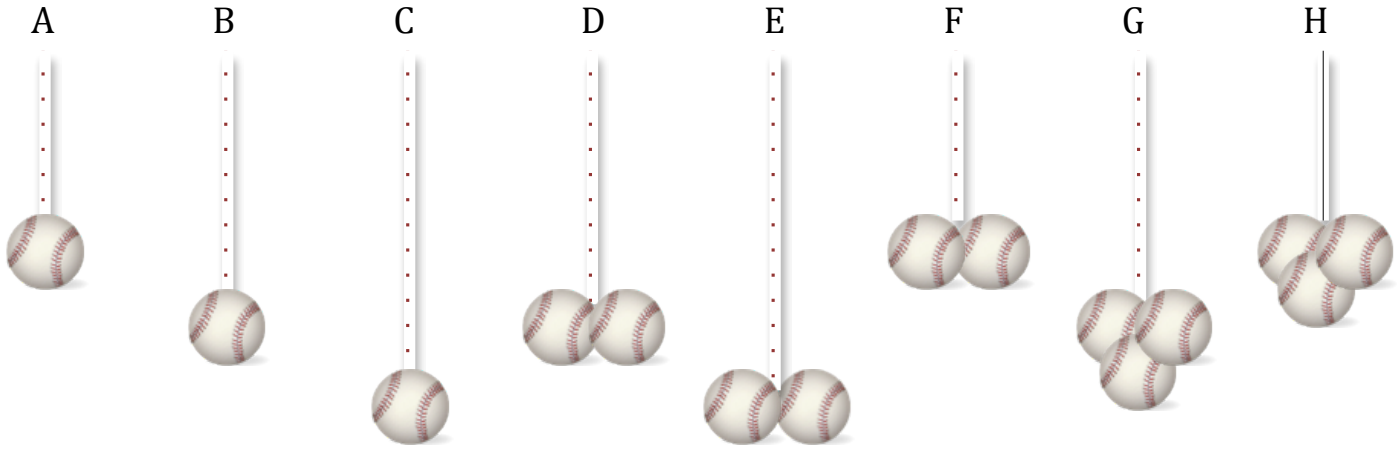
3. Calculate the period for the pendulum.

4. Calculate the frequency, angular frequency, and the value of g.



The Best Damn Pendulums Period!

The eight pendulums below are set oscillating. Rank them from largest to smallest based upon the period of oscillation. If some are equal to others put an equal sign between them.



Example 2: Find the rotational inertia of the baseball bat about its end.

Example 3: Estimate the torsion constant for the spring.

Lecture 29 - Summary

The requirement for SHM is $a = -\omega^2 x$

For a spring $\omega = \sqrt{\frac{k}{m}}$

For a simple pendulum $\omega = \sqrt{\frac{g}{\ell}}$

For a physical pendulum $\omega = \sqrt{\frac{mgr}{I_p}}$

For a torsional pendulum $\omega = \sqrt{\frac{\kappa}{I_p}}$