

## LAB 10. CUT PENDULUM CHALLENGE

### Introduction

Without any practice, swing a weight on a thread so that the thread is cut by a stationary blade, launching the weight so that it lands on the floor where you predict. If you succeed, you are done. If not, you must write a lab report analyzing what went wrong.

### Supplies

Weight, thread, ring stand, clamp, paper, tape, carbon paper

### Challenge

#### Setup

1. Hang the weight from the thread.
2. Position the ring stand, clamp, thread, and weight so that the weight can swing by the edge of the table.
3. Select where to put the cutting blade so that the thread holding the weight will be severed when the weight swings by.
4. Predict where the weight will land on the floor. Keep records of your measurements, derivations, and calculations.
5. Tape a piece of paper to the floor and mark an "X" where you predict the weight will land.

#### Test

1. Place a piece of carbon paper face down over your paper with the "X".
2. Place a blank piece of paper atop the carbon paper to protect it from impact.
3. When the instructor provides you a cutting blade, position it as you designed.
4. While the instructor watches, swing the weight as you designed, so that the blade cuts the thread and the weight falls to the floor.

If the landing weight makes a carbon paper mark on the "X", you do not need to write a report.

### Lab Report

Your lab report will concisely and candidly analyze why you did not correctly predict the landing point. It should include

- The paper with the "X" and the fateful carbon mark
- The derivation of your formula for the landing point, thoroughly explained
- Explanation of why the weight landed elsewhere
- Derivation, with explanation, for a formula that correctly locates the landing point