

PHYS 310 — Homework #1

Reading:

- PHYS 211/212 Lab Manual Appendix: *Notes on Propagation of Uncertainties and Statistics*
- Hughes and Hase, Chapters 1 & 2

Problems due Tuesday January 26:

1. Hughes and Hase, 2.2
2. Hughes and Hase, 2.3
3. Hughes and Hase, 2.6
4. Consider the following example data for timing pendulum swings. Assume that the experimental standard deviation for the experimenters' timing of pendulum swings is $s = 0.04\text{ s}$. In experiment A the experimenters timed 12 sets of 10 swings, and in experiment B the experimenters timed 1 set of 120 swings.

Results of Experiment A: Average time for 10 swings = 28.39 s.

Results of Experiment B: Time for 120 swings = 340.61 s.

Determine the value of the period for each of these experiments including the uncertainty ΔT .

5. Consider the following results for the measurement of the period of pendulum (in seconds): {4.1075, 4.39831, 4.19365, 4.20259, 4.26921, 4.13037, 3.97548, 4.51314, 4.01286, 4.0101, 4.15578, 4.35153, 4.30801, 4.21082, 3.94315}. Without using a computer, a calculator, or any other method of quantitative computation, estimate the mean and standard deviation of the measurements. Explain your method.