

PHY1308 - Homework 11

Expectations for the quality of your handed-in homework are available at <http://www.physics.smu.edu/sekula/phy1308/homework.pdf>. Failure to meet these guidelines will result in loss of points as detailed in that document. **This assignment is due on Tuesday, April 26 by 9:30am.**

Reading Assignment

- Chapter 30-31

Practice Problems

These are not required; they are odd-numbered problems from Wolfson that may help you to warm up for the required problems.

- *You'll get practice from some of the odd-numbered problems required below.*

A Note on Significant Figures

Wolfson's representation of numbers can often make interpreting the number of significant figures very difficult. Here are some rules you can follow and to which the solutions will adhere:

1. If an integer number has a trailing zero (e.g. 50 or 100), but no decimal point to indicate that zero is significant, TREAT THE TRAILING ZEROS AS SIGNIFICANT.
 - a) Example: 100 will have three significant figures. 50 will have two.
2. If an integer less than 10 is given, assume it is INFINITELY SIGNIFICANT
 - a) Example: 2 has infinite precision, and should be treated like 2.0000000...

Required Problems

- CH30-13 [3 Points] (Answer is in the back of the book. Points will be awarded based on your method and not your answer)
- CH30-18 [5 Points]
- CH30-24 [5 Points]
- CH30-68 [10 Points]
- CH31-17 [3 Points] (the answer for this is in the back of the book, so you can work it and check your own answer. Points will be awarded based on your method and not your answer).
 - Bonus [4 Points]: Next time you're in a DSW, check the angle of the mirror to see how close it comes to the answer to this problem. Here is the bonus question: using only materials you will find in a shoe store, how can you determine the angle the shoe mirror makes with respect to either the floor or the normal to the floor?
- SS-19 [5 Points]
- CH31-18 [15 Points]

Problem SS-19: Designing a clothing store mirror

You are designing a clothing store mirror, but you are trying to do it as cheaply as possible. Less mirror surface = less cost. The mirror is intended to allow a person, standing 0.50m from the mirror, to see their entire body (top of their head to the tips of their shoes) where they meet the floor. Since your average human being is 1.7m tall, you intend to have the top of the mirror be 2.0m off the floor so an average person is guaranteed to see the top of their head. How far above the floor (at a height, h) does the bottom of the mirror need to be so that a 1.7m-tall person can just see the tips of their shoes where they meet the floor? (See the illustration below)

