Physics 1090 Homework #1

Due Thursday, September 3

Reading assignment: Chapters 1, 2, 3 of the notes.

1. Here's an exercise problem for Babylonian students, from the Yale Babylonian collection (YBC 4186) (Quoted from *History of Mathematics*, J. Fauvel and J. Gray, p 27):

A cistern is 10 GAR square, 10 GAR deep (a GAR is a nindan, equal to 12 cubits: this is an immense cistern!) A standard Babylonian garden plot is one square nindan. How many garden plots can be irrigated to a depth of one finger from the full cistern? The answer given is written 1, <<<< meaning 1,40 (but what number is that?! Don't forget 1 and 60 , etc., are the same!)

2.

Find the height of this lamppost in front of Newcomb Hall by measuring the length of its shadow, and the length of your shadow at the same time of day, and your height. (You can measure in paces.)

---

3. Find the spot (it's at ground level, as you can see!) where this photo was taken from.   Notice that the head of the statue is very close to in line with the top of Cabell Hall.

Pace off the distance from the place the photo was taken to the statue, then to Cabell Hall, and deduce the ratio of the height of Cabell to the height of the statue. Now find the height of the statue (use the shadow—or just try to measure it) and therefore the height of Cabell Hall.

4. Go to the path along Emmett St across from the Bookstore Parking Garage, the path alongside

the pond. Find the point (close to where this was taken) directly across the pond from the little archway.

Walk from this point to the stone wall that juts out from the path to the edge of the pond. Imagine a line going from you across the pond (now diagonally) to the little arch. Use a protractor to measure the angle between that line and the stone wall. Now, by pacing off the distance between the stone wall and the place directly across the pond from the little arch, you should be able, with a diagram, to find the distance from the path to the little arch, using Thales' method for finding the distance of a ship at sea. Do it.