PHYS 1401 General Physics I
Homework #8

For the first three questions, express your final answer in the form of a ***complete sentence***, with the correct units and number of significant figures. Do not just circle a number. Show all calculations, and draw diagrams where appropriate. The last six questions are found on the Mastering Physics site, and are worth a point each.

It would be a good idea to try the Tutorials before tackling the homework problems. If you complete the entire Tutorial for Homework #8, you will get 1 bonus point. If you complete any part of the Tutorial, you will get half a bonus point.

Do these problems on paper and turn them in

1. (1 points) Chapter 7, Problem 8, p.2145

2. (1.5 points) A skier slides straight down an incline of 25 degrees without using her poles. The slope itself is 96 meters long, and the skier starts from rest at the top. Solve this problem using energy methods, then compare to the answers you got for this problem in Homework #4.

    a. What would the velocity of the skier be at the bottom of the incline if friction can be neglected?
    b. What would your answer be to the previous question if the coefficient of kinetic friction between the skis and the snow is 0.13 on the incline?
    c. Upon reaching the bottom of the incline in part b, she reaches a flat portion, and decides to just let friction slow her to a stop. How far does the skier travel along the horizontal portion before coming to a stop, if the coefficient of kinetic friction is 0.28 on the flat portion?

3. (1.5 points) An archer stands on a cliff with his bow 32.5 meters above a valley and fires an arrow with a mass of 35.1 grams straight upward.

    a. If the bow has an average "pull strength" of 131 N and the arrow travels 0.762 m (the "draw length") before it leaves the bow, how much work does the bowstring do on the arrow?
    b. How much kinetic energy does the arrow have when it leaves the bow? How fast is it going?
    c. The arrow goes straight up, and since air resistance and wind can be neglected today, comes straight back down and lands in the valley below. Draw a diagram for its motion, and create formulas for the kinetic energy and potential energy of the arrow at three points: when it leaves the bow, at the peak of its motion, and when it hits the ground in the valley.
    d. Use energy methods to find how high the arrow gets.

e. Use energy methods to find the speed of the arrow when it hits the ground.

These are the problems from the book that are online. The data are different, so you can work them out without numbers and then go online.

1. Chapter 7, Problem 7, p. 215
2. Chapter 7, Problem 15, p.216
3. Chapter 7, Problem 26, p.216
4. Chapter 7, Problem 63, p.219
5. Chapter 7, Problem 70, p. 219
6. Chapter 7, Problem 83, p. 220