PHY180F ASSIGNMENT 6 2005

Due When: Thursday November 10 by 4:00 P.M.
Due Where: In your tutor's drop box in the basement of the Physics building (tower)
opposite the elevators.

1) In the class demonstration of the "loop-the-loop" we attempted to find the height from which the ball would have to be released so that it would be just about to leave the track when it reached the top of the loop. We made the assumption "that no energy is transferred to the track" and we calculated that the height **h** should be 2.5 **R** without taking into account the rolling motion of the ball and 2.7 **R** when the rolling motion of the ball was taken into account. We measured the diameter of the hoop and found the radius **R** to be 20 cm. The experimental value of **h** (which was slightly different in the two different lectures) was found to be about 65 cm.
   a) If we take our experimental value of **h** as the reference, what is the percentage difference in our calculated and experimental values of **h**?
   b) Use your observations when the demonstration was first performed and on the day that this assignment was handed out. You will have to make approximations of distance since you were unable to make direct measurements. Using the potential energy of the ball when it was released as the reference, what fraction of the energy of the ball (expressed as a percentage) was transferred to the track during the demonstration.
   c) If you compare your results of (a) and (b) can you draw any conclusions.

2) Serway, Chapter 8; Number 58

3) Serway, Chapter 10; Number 70

4) Serway, Chapter 11; Number 14