

Physics 113 - Fall 2006 - workshop module 5

Work, energy, gravitation,

Between having to repeat half of one lecture due to the premature cutoff of the streaming video and the exam, the synchronization of the lecture and workshop is poor. So, this week I'm only giving you a couple of new problems. If last week's workshop was tough for your section, please look at those problems again. They may make more sense to you after Tuesday's lecture this week. If you would like, you can also go over the solutions to exam 1 which your TA has (and will be posted when we hand out the exams after grading).

1. A car is stopped by a constant friction force that is independent of the car's speed. By what factor is the stopping distance changed if the car's initial speed is doubled?
2. A block of mass $M=5$ kg is released from rest and slides down a frictionless ramp of height h above the floor. The ramp makes an angle of 30 degrees with the horizontal. At the bottom of the track the block slides along the horizontal floor, around a vertical loop (loop-the-loop). The loop in the track has a radius of 0.2 meters. As the block passes the top of the loop, it never loses contact with the track. Once past the loop, the block encounters a region in the track where there is a rough surface (friction). μ_k between the block and the track in this region is 0.15.
 - (a) What is the minimum value for h , the starting height of the block above the floor?
 - (b) Assuming the value of h in part (a), what is the speed of the block at the bottom of the ramp?
 - (c) How far does the block travel along the part of the track with friction before it comes to a stop?

