Problem Set #4

Due Friday, October 31 by 5pm to Dickinson 104

Unless otherwise indicated, all problems come from "Essentials of College Physics"
Make sure to clearly state all assumptions you make and to show your work.

Important note: For many of these problems, you *can* solve them using the kinematic motion + force equations we've used to date. However, one of the points of doing these problems is to get a better understanding of how to use *work* and *energy* to solve these problems. So, while you will certainly use things like force balance and simple kinematics arguments in this problem set, the ***core*** of your approach to most of these problems should be a work- or energy-based approach.

1. A (slightly modified) version of a conceptual question in the book: *As a sled moves across a flat, snow-covered field at constant velocity, is any net work done on the sled? How does air resistance enter the picture?*
2. Problem 5.5
3. Problem 5.13
4. Problem 5.33
5. Problem 5.53
6. Problem 5.54
7. Problem 5.63 (*Hint for part (d): velocity will be a maximum when a=0*)
8. Problem 5.64

Individual Problem: Problem 5.57