Phys 410 – Homework #2

All problems from Taylor.

1) 2.5 (3 pts).
   a) The solution is given in section 2.2 of the text. You should describe the behavior and draw a simple sketch of the velocity as a function of time.
2) 2.8 (3 pts)
3) 2.11 (a, b, and c) (9 pts).
4) 2.38 (a, b, and c) (9 pts)
   - It's easiest to let (+y) point up, so that v_0 is a positive number.
   - Start with equation 2.52, except let gravity be negative. Then separate variables and integrate to find v(t).

5) EXTRA CREDIT (3 pts) A particle of mass *(m)* moves in a medium under the influence of a velocity-dependent retarding force equal to $mk(v^3 + a^2v)$, where *(k)* and *(a)* are constants, and *(v)* is velocity. There is a maximum distance the particle can move, independent of the initial velocity. Find an expression for this maximum distance, in terms of *(k)* and *(a)*. Also determine if the particle's velocity will ever reach zero.

Optional problems, for further study. If you attempt one of these, we will read your solution and give you written feedback. No extra credit. Solutions will be posted.

6) 2.19 (a and b)
7) 2.43 (a and b) (numerical)