Physics 262: Problem Set #1

These problems are due by the end of the day on Friday, Jan. 6 in the graders' box.

1. Shankar, problem 3.2.8 pg. 72.
2. Consider a uniform *semi*-circle of radius R and mass m. Locate the center of mass and find the moment of inertia about that center of mass. That is, if the semicircle is defined by $x^2 + y^2 < R^2$ and $y > 0$, find y_0, the height of the CM. Do this by explictly writing out the integrals you need to do, and then either do the trig substitutions as needed, or ask Mathematica for the results. As as *last* step, verify the parallel axis theorem. (We'll step through this problem in the Thursday session.)
3. Morin 8.30 (Semicircle CM) p. 340
4. Morin 8.10 (Removing a support) p. 335
5. Morin 8.26 (Swinging stick) p. 339
6. Morin 8.47 (The spool) p. 342
7. Morin 8.64 (Colliding sticks) p. 346
8. (BONUS) Morin 8.7 (Slick calculations of I) p. 334 and Morin 8.34 (A triangle, the slick way) p. 340