Classical E&M Homework 01

September 26, 2005
Due date: October 10, 2005

1. Let's start with a review problems for the statis situation in electromagnetism.

   - (20 points) Jackson Problem 5.1 (You should be very rigorous in the derivation.)
   - (20 points) Jackson Problem 5.3
   - (10 points) From the result of Jackson's problem 5.3, what happens to the two angles θ_1 and θ_2 for infinite solenoid? Taking this limit, calculate the magnetic field on the cylinder axis in case of infinite solenoid.

2. (20 points) In the textbook and during the class, we have examined the distortion of (initially) gaussian shaped wave packet inside the dispersive media. (Jackson 7.9) Repeat the same procedure for the new dispersion relation $\omega(k) = \nu(1 + ak)$. Discuss the result.

3. (20 points) Jackson Problem 7.2

4. (20 points) Jackson Problem 7.19

5. (20 points) Jackson Problem 7.13

6. (20 points) Jackson Problem 7.15