Physics 504 Ordinary Homework #8
Due: April 14, 2011

1. [10 pts] Do Jackson Problem 12.7. Some comments:

   - I don't know why he bothers to call the total 3-momentum $\vec{G}$, but it is the sum of the 3-momentum of the electromagnetic field and the canonical momentum of the particle.
   - In part (a), is your answer gauge-invariant? If not, is there a choice which gives momentum conservation for most of the components in part (b)? Why are the other components not conserved?
   - In part (c), the initial conditions are different from those of part (a) — the particle is not entering from outside the region. Can you make momentum conservation work in this case?

2. [15 pts] Do Jackson Problem 12.9 part a and Problem 12.10.

3. [10 pts] Do Jackson Problem 12.14