

PHY 504

Problem Set #12

due 4 December 2008

1. A charged relativistic particle enters a uniform electric field oriented perpendicular to its motion.
 - (a) Write down the Lagrangian and Lagrange's equations.
 - (b) Solve. Take the nonrelativistic limit of your solution and show that it has the correct form.
 - (c) Express your solution parametrically as a function of the proper time.
2. Repeat Problem 1 for a charged relativistic particle in a uniform magnetic field. (You may skip part (b)). Obtain the Hamiltonian from Noether's theorem.
3. Problem 7.26.
4. Problem 8.13.