

Reading: Chapters 9.6, 10

Problems:

1. From the Aug '02 subject exam:

Consider a charged particle of mass  $m$  moving in a constant magnetic field of magnitude  $B$  in the  $z$  direction. The motion can be described by a Lagrangian such as  $L = \frac{1}{2} m \vec{v}^2 + e B x v_y$ .

(a) Write down the corresponding Hamiltonian for this system in terms of an appropriate set of canonical variables. (b) Write down the Hamilton-Jacobi equation for this system. (c) Outline the procedure that can be used to solve this equation.

2. Goldstein, Problem 10-5.

3. Goldstein, Problem 10-8.

4. Goldstein, Problem 10-26.