

## Problem set for chapter 9, Due Monday, April 23

1. Ibach and Lüth, first edition, problem 9.2.
2. Ibach and Lüth, first edition, problem 9.3.
3. Using the linearized Boltzmann equation, calculate an expression for  $j_Q$  in a small electric field, and thermal gradient, both in the x-direction for a Fermi liquid of effective mass  $m^*$  and a spherical Fermi surface. You should obtain expression for both  $\mathcal{L}^{21}$  and  $\mathcal{L}^{22}$ . Show that  $\mathcal{L}^{21} = \mathcal{L}^{12}$  for this system, this is called the Onsager reciprocity relation.