

## PHY410 Homework Set 7

1. [5 pts] Kittel-Kroemer, problem 6-1.
2. [5 pts] Kittel-Kroemer, problem 6-3. Note that the average occupancies in the two cases there are not the same. Sketch those occupancies vs  $x = \exp(\epsilon - \mu)/\tau$  illustrating the difference.
3. [5 pts] Kittel-Kroemer, problem 6-4. Note that you do not really need to know relativity to work out this problem. You just need to use  $\epsilon = pc$  rather than  $\epsilon = p^2/2m$  as the relation between energy and momentum. A linear relation between energy and momentum is, incidentally, valid for electrons moving in graphene.
4. [10 pts] Kittel-Kroemer, problem 6-9.
5. [10 pts] Kittel-Kroemer, problem 6-10.
6. [10 pts] Kittel-Kroemer, problem 6-11.