

Due date: Thursday, Oct. 10

Deadline: Tuesday, Oct. 15

1. (10) a) 3.36a Finding the chemical potential of a large Einstein solid. Start with your result for S in problem 3.25a. b) Find μ in the limits $q \gg N$ and $N \gg q$; which is larger?
2. (10) 3.37 Finding the equilibrium distributions by equating chemical potentials.
3. (10) 4.1 Efficiency of a cycle of isobars and isochores. This makes use of the results of Problem 1.34. Use $f = 5$ and restate the relevant results of that problem.
4. (10) 4.3 Interesting application of these ideas to daily life: Waste heat from power plant.
5. (5) 4.4a Efficiency of using oceanic thermal gradient. [Part b is not very straightforward, so is not assigned; the answer is of order 10^3 m^3 .]

Other problems are also interesting, esp. 4.6, but it is not assigned because the algebra is messier than the solution is worth. Try it if you have extra time. In any case, read it for a better sense that the straightforward Carnot cycle in standard texts is not very useful practically and must be modified to produce useful amounts of work.