

**Due date:** Thursday, Oct. 9

**Deadline:** Tuesday, Oct. 14

1. (10) 3.37 Finding the equilibrium distributions by equating chemical potentials.
2. (10) 4.1 Efficiency of a cycle of isobars and isochores. This makes use of the results of Problem 1.34, most of which was worked out in class and will be reviewed on Oct. 7. Use  $f = 5$  and restate the relevant results of that problem.
3. (10) 4.3 Interesting application of these ideas to daily life: Waste heat from power plant.
4. (5) 4.4a Efficiency of using oceanic thermal gradient. [Part b is not very straightforward, so is not assigned; the answer is of order  $10^3 \text{ m}^3$ .]
5. (10) 4.6 a, b, d. Use the result for  $T_{\text{hw}}$  in part c; the formula for  $T_{\text{cw}}$  is the same as for  $T_{\text{hw}}$  if  $T_{\text{h}}$  and  $T_{\text{c}}$  are switched with one another. Note that the straightforward Carnot cycle in standard texts is not very useful practically, as mentioned in class, and must be modified to produce useful amounts of work.