

Problem Set #5

Physics 436

Friday, 18 February 2022

The following problems come from Schroeder's *An Introduction to Thermal Physics*:

- Problem 2.17 on page 64 (*10 points*) \Rightarrow This short problem sets up the next two problems in this problem set.
- Problem 3.5 on page 91 (*10 points*) \Rightarrow You are given the answer. If you do not get it, you may have an error in Problem 2.17.
- Problem 3.8 on page 93 (*10 points*) \Rightarrow After finding C_V , make a nice graph of C_V/Nk versus kT/ϵ for $0 \leq kT/\epsilon \leq 0.2$. The choice of plotting parameters makes everything dimensionless.
- Problem 3.14 on page 97 (*10 points*) \Rightarrow Assume that $S(0) = 0$, meaning there is no residual entropy at absolute zero.
- Problem 3.16 on page 98 (*10 points*) \Rightarrow This cute problem sets a lower limit on the heat expelled when a gigabyte of memory is either erased or overwritten.

Due date: **Friday, 25 February 2022**