Physics 831 - 2002
Statistical Physics

Problem Set 8

1. Consider a system of $N$ noninteracting quantum oscillators with the same angular frequency $\omega_0$ and mass $m$, at temperature $T$. Find the partition function, entropy, and the specific heat $C_V$. Compare to the classical result you obtained before. Make a plot of $C_V$ as a function of $kT/\hbar\omega$ (7pt)

2. Do the calculation needed to make a transition from Eq. (8.43) to Eqs. (8.44), (8.45) of the textbook. (8 pt)