PHY 4523 Spring 2001 – Homework 6

Due by 5:00 p.m. on Wednesday, April 11.

Answer all questions. To receive full credit, you should explain your reasoning and show all working. Please write neatly and remember to include your name.

1. *Density of states for a 2D QM ideal gas.*

   Repeat the calculation of the density of states $\rho(\epsilon)$ given in class (and in Reif Ch. 9) for the case of a **two**-dimensional gas of non-interacting quantum mechanical particles confined to a rectangular box such that the coordinates (x, y) of each particle satisfy $0 < x < L_x$ and $0 < y < L_y$. Perform the calculation both for perfectly reflecting walls (the "particle in a box" problem) and for periodic boundary conditions.

2. *Cavity radiation.*

   Reif Problem 9.9.

3. *Power radiated by a body at fixed temperature.*

   Reif Problem 9.12.