

Exercises in Statistical Mechanics

Based on course by Doron Cohen, has to be proofed
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This exercises pool is intended for a graduate course in “statistical mechanics”. Some of the problems are original, while other were assembled from various undocumented sources. In particular some problems originate from exams that were written by B. Horovitz (BGU), S. Fishman (Technion), and D. Cohen (BGU).

===== [Exercise 0140]

Spectral functions for two dimensional box

What is two dimensional gas?

Given gas in a box with dimensions $(L \ll L) L \times L \times L$.

Determine what are the energies of the uniparticle states. Show that there's an energy range $0 < E < E_{max}$ where it's possible to relate the gas as a gas in a $2 - D$ space with a states density function

$$g(E) = A \frac{m}{2\pi} \quad 0 \leq E \quad (A \equiv L^2)$$