

## 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 6040]

#### Effusion of electrons from a box in magnetic field

Electrons are in a given box, in the presence of a magnetic field  $B$ . We drill a hole in the box and measure the spin of the emitting electrons, with velocity  $v < v' < v + dv$ . Find  $\alpha \equiv \frac{\Delta N_t}{\Delta N_v}$  using  $m, r, B, \beta\mu$ . Assume  $H_1 = \frac{p^2}{2m} - rB\sigma_z$ .

