

## 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 2210]

#### Harmonic oscillator, Heat capacity

Find the energy and the heat capacity of the next system:

$$\hat{H} = \frac{\hat{p}^2}{2m} + \frac{1}{2}m\omega^2 \hat{X}^2$$

This system can be a model to a particle adsorbed to the surface of a solid. Compare to the result you get in a classical treatment.

