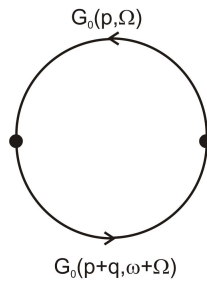


## Homework assignment 2a: Green functions at finite temperature (Chapter 8 from Coleman' textbook)

(Dated: January 16, 2020)



- Problem 1.

Starting from the definitions derive the unperturbed electron and phonon propagators at imaginary time/Matsubara frequency.

- Problem 2. Using propagators derived in Problem 1 find the densities of non-interacting phonons and electrons as functions of temperature.

- Problem 3. Using analytical continuation calculate the density response function (polarization operator) of Fermi gas at finite temperatures. The diagram is shown in the figure.