

Exercise 3

03.04.2025

Arslan Mazitov

Combinatorics and grand-canonical ensemble

- Binomial coefficient: $\binom{n}{k} = \frac{n!}{k!(n-k)!}$
- Stirling approximation: $\ln n! \approx n \ln n - n$
- GC Ensemble: $\Xi = \sum_{\nu} \exp [-\beta(E_{\nu} - \mu N_{\nu})]$
- Entropy: $S = k_B \ln \Xi$

