Homework Assignment # 5

Physics 5163: Grad. Stat. Mech.

Due: Monday, Mar. 6

Instructions:

Homework is due at the start of the Monday's class. You may turn it in at the lab, in my mailbox office, or after class on Monday.

Reading: I am assigning reading on probability theory. I don't intend to discuss it in class unless you ask me to do so. We'll set up the fundamentals of statistical mechanics vi ergodic theory.

- Reichl, Ch. 4. up to and including 4.E.3. (The Poisson distribution).
- Reichl, Ch. 6 up to and including S6.A (the BBGKY hierarchy).

Below is the list of key ideas to focus on in the reading:

- permutations and combinations
- definition of probability
- probability distributions and a few examples (Gaussian, etc.)
- Louisville's theorem
- Ergodic theorem
- BBGKY hierarchy

Problems: Please solve the following:

1. Reichl, Problem 4.2
2. Reichl, Problem 4.2
3. Reichl, Problem 6.1

Questions: Answer the following questions.

1. Explain the basic ideas or implications of the Poincaré recurrence time, and the H-theorem. How does the Poincaré recurrence time cause a problem for the H-Theorem?