

## Physics 613, PS #4

- 1) ~~Find~~ Calculate the probability that an arbitrary ideal gas ~~has~~ in the Grand Canonical ensemble has exactly  $N$  particles. Express your answer entirely in terms of  $N$  and  $\bar{N}$ , the mean number.
- 2) Repeat the above calculation for a gas of non-interacting particles all moving in an external potential  $\phi(\vec{r})$ .
- 3) What is the statistical significance of your answers to questions 1 and 2?