Assignment #3

1. Explain in your own words what the Boltzmann entropy of a macrostate measures. According to Boltzmann, why does this quantity increase (or remain constant) over time?

2. Explain in your own words what the Gibbs entropy of a Gibbs distribution ρ measures. Why does this quantity remain constant over time? *Extra credit*: How might you argue that it increases over time?

3. What is the difference between the probabilities p_i that appear in one formulation of the Boltzmann entropy, and the distribution $\rho(x, t)$ that appears in the Gibbs entropy?

4. Explain the difference between the Gibbs microcanonical distribution and the Gibbs canonical distribution.