CS485 Spring 2007
Homework 2

Due Date: Feb 2 2007

1. In $G(n, \frac{1}{n})$ what is the probability of a vertex of degree $log(n)$?

2. For d a constant $\lim_{n \to \infty} \left(1 - \frac{d}{n}\right)^n = e^{-d}$. What happens if d is a function of n (i.e. $d(n)$)? For example, what is $\lim_{n \to \infty} \left(1 - \frac{ln(n)}{n}\right)^n$? What about some other functions?

3. Consider a random permutation of integers 1 to n. Scan the permutation. How often do you encounter an integer greater than any seen so far?

4. Let M_p be a multiset formed by drawing $p.n$ integers from the set $\{1, 2, \ldots, n\}$ with repetition.

   (a) How large must p be in order to have some integers appear twice?

   (b) How large must p be in order for every integer to occur in M_p?