

Homework 12

Due: Thursday, December 10, 2009, beginning of the class

PLEASE READ THE INSTRUCTIONS/SUGGESTIONS WRITTEN IN THE SYLLABUS!
ALL PROBLEMS ARE FROM THE 3rd EDITION OF THE TEXTBOOK.
(GHAHRAMANI: FUNDAMENTALS OF PROBABILITY)

- Hand in the following problems:
 - Page 484-485: 1, 2, 3, 5
 - Page 506: 2, 8 (you may need the table for $\Phi(x)$ from p. 632 of the textbook)
 - Problems 1 and 2 from the first Markov Chain lecture notes
- Practice problems (you do not need to hand these in!):
 - Page 484-485: 4, 7, 8, 9, 10, 11
 - Page 506: 5, 6, 7, 11, 13
 - Page 560-561: 1, 3, 5, 6

- Bonus problem:

Let X be a random variable and $c > 0$. Prove that

$$P(X > t) \leq M_X(c)e^{-ct}$$

where $M_X(\cdot)$ is the moment generating function of X .

Using this try to give the best possible estimate you can get for $P(X > 100)$ where X is a Poisson with parameter 50.

DISCLAIMER: It is easy to find the solutions to (some of) these questions. (E.g. the internet, your fellow classmates ...) However, do NOT consult any of these solutions when working on this assignment or you will learn nothing from it and your chance of passing the course will be greatly diminished. If it becomes apparent to the grader that your solution is copied from existing solutions, you will be assigned a grade of zero for lack of originality.

REMINDER: The final exam will take place on Thursday, December 17 from 7:45AM to 9:45AM at VV B211. It will cover everything we discussed in class during the semester.