Homework 1 due on Wednesday October 14, 98

Chapter 1, Problems 2, 4, 6, 13, 16;
Chapter 2, Problems 3, 9.

Grades distribution for HW1

15, 29 , 33, 35, 37, 39, 40, 40, 41, 41, 42, 42, 44, 45, 45, 45, 50, 50, 50, 50.

Homework 2 due on Wednesday October 28, 98

The first two problems are related to typical mistakes in HW1.

1. Let $\{r_1, r_2, ...\}$ be the set of all rational numbers on $(0,1)$. Define open subintervals of $(0,1)$ by $A_n = (0,1) \cap (r_n - 4^{-n}, r_n + 4^{-n})$. Is it true that $(0,1) = \cup_{n=1}^{\infty} A_n$. (Hint: you may like considering a random variable uniformly distributed on $(0,1)$.)

2. Let $\{r_1, r_2, ...\}$ be the same as above and X be a random variable such that $P(X = r_n) = cn^{-2}$, where the constant c is chosen so that

$$c \sum_{n=1}^{\infty} n^{-2} = 1.$$

Prove that the distribution function of X is discontinuous at any rational point in $(0,1)$. (Hint: see Problem 5 of Chapter 3.)

Also

Chapter 2, Problem 15;
Chapter 3, Problems 2, 5, 9, 11 (without constructing X), 29, 31, 33.

Grades distribution for HW2

19, 35, 35, 37, 40, 40, 41, 42, 42, 43, 43, 44, 44, 46, 47, 48, 48, 49, 50.

Homework 3 due on Wednesday November 11, 98

Assume the definition of expectation given in class (that is the property asserted in Problem 4, Ch 4). Solve the following problems

Chapter 4, Problems 2, 10, 20, 21, 26, 29, 32.

Grades distribution for HW3

35, 36, 39, 41, 41, 43, 43, 44, 44, 45, 46, 47, 48, 48, 48, 48, 50, 50, 50.

Homework 4 due on Wednesday November 25, 98.

Chapter 5, Problems 15, 21 (only the first question), 31,
Prove that the product of two probability generating functions is a probability generating function,
Chapter 6, Problems 4, 9, 10, 19.

Grades distribution for HW4

40, 41, 42, 42, 43, 43, 44, 44, 45, 45, 45, 45, 45, 46, 46, 48, 49, 49.

Homework 5 due on Wednesday December 9, 98 (I will be collecting homeworks and finals in my office from 10 to 11 am on Dec 9)

Chapter 6, Problem 12;
Chapter 7, Problem 21 (without countable additivity of R),
Chapter 8, Problems 3, 1, 6, 11, 12, and the following.

Let numbers $a_k^n \geq 0$ and a_k be given for $n, k = 1, 2, \ldots$. Assume that $a_k^n \to a_k$ as $n \to \infty$ for any k. Also assume $\sum_k a_k^n \to \sum_k a_k < \infty$. Prove then that

$$\lim_{n\to\infty} \sum_k |a_k^n - a_k| = 0.$$

Grades distribution for HW5

6, 18, 40, 43, 44, 45, 45, 48, 48, 49, 50, 50, 50, 50.