Math 447 - Spring 2026 - Homework 04

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Status - Reading Assignments:

Here are the reading assignments to be completed before the first one of this HW.

MF447 lecture notes:

ch. 1 - 5.2

WMS (Wackerly, et al. Textbook):

Nothing assigned yet

Other:

Nothing assigned yet

New reading assignments:

It is really important for the WMS reading assignments that you work through the examples!

Reading assignment 1 - due Monday, February 9:

- **a.** Carefully read MF ch.5.3. You will find it easier to understand it if you look at the introduction.
- **b.** Carefully read MF ch.5.4. You will find it easier to understand it if you look at the introduction. Be sure to understand all definitions and facts given there. You will have to answer many questions concerning independence in the upcoming quizzes and exams, and the concept of iid sequences of random elements is a central one in all of probability theory and statistics. There is only one example, Example 5.15, but if you work carefully through it, you'll be in good shape.

Reading assignment 2 - due Wednesday, February 11:

- **b.** Review WMS ch.2.1 - ch.2.4.
- **c.** Carefully read WMS ch.2.5 - ch.2.8. Except for WMS ch.2.6, the theory behind all this material has been covered in the MF notes. Work through all the examples of WMS ch.2.6! Be aware that many exam and quiz problems need knowledge of the ch.7 material for their solution!

Reading assignment 3 - due Friday, February 13:

- **a.** Extra carefully read MF ch.7. Be sure to work all the examples! Note that you have encountered much of the material in WMS ch.2.6 (reading for Wednesday).

General note on written assignments: I will not collect those assignments for grading but doing them might be helpful for your quizzes and exams.

(a) If you did not get around to do those last week: Write from memory the following definitions and compare them with the MF lecture notes:

- probability measures and probability spaces (ch.5 definition!) • equiprobability • Continuity property of probability measures (optional, but helpful)
- discrete probability spaces • Theorem 5.2 and Cor.5.1
- Read again Remark 5.9. In part **(d')**, understand the cases $n = 2$ and $n = 3$.
- Review the (optional) Fact 5.1. You will not be quizzed on it, but you want to understand it.
- Additive law of probability and the rule of the Complement
- Work Remark 5.12 closed book!
- Conditional probability • Multiplicative Law of Probability • Independence of $2, 3, n$ events and of sequences of events
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(b) Write from memory the major definitions and theorems of ch.5.3, ch.5.7, ch.7, and compare them with the MF lecture notes. In particular the connection between the distribution $\mathbb{P}_X$ and $\mathbb{P}$ for $X : (\Omega, \mathbb{P}) \to \Omega'$

(c) Work closed book through Example 5.15 of Ch.5.4. Try to adapt it to show mathematically that a sequence of coin tosses is independent.

(d) Be sure to understand conditioning and independence. If the MF ch.5.2 and ch.5.4 material gives you trouble, read the corresponding pages in WMF ch.2 and then go back to the MF doc.

(e) All WMS exercises below are odd-numbered, so the solutions are in the book.

- WMS ch.2.5 exercises: #2.25, #2.27, #2.29, #2.31
- WMS ch.2.6 exercises: #2.35, 2.37, 2.43, 2.45, 2.55, 2.61, 2.68
- WMS ch.2.7 exercises: #2.71, 2.75, 2.79
- WMS ch.2.8 exercises: #2.95, 2.101, 2.107