

## Math 447 - Spring 2024 - Homework 07

Published: Wednesday, February 21, 2024

### Status - Reading Assignments:

Here is the status of the reading assignments you were asked to complete before the first one of this HW.

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WMS (Wackerly, et al. Textbook): ch.1 - 4.9

MF447 lecture notes: Ch.1 - 7.8

Other: Nothing assigned yet

### New reading assignments:

- MF ch.8 comes with very few examples. You should look for those in WMS ch.5!

### Reading assignment 1 - due Monday, February 19:

- Carefully read MF ch.8.1 – 8.3. Be sure to recognize that some of the formulas for expectations and variances are identical for discrete random variables
- Carefully read WMS ch.4.1 – 4.3.

### Reading assignment 2 - due Wednesday, February 21:

- Carefully read MF ch.8.4 – 8.5.
- Carefully read WMS ch.4.10. We will skip the optional WMS ch.4.11, so we have reached the end of WMS ch.4.

### Reading assignment 3 - due Friday, February 23:

- Carefully read MF ch.8.6 – 8.7
- Take a look at the very short MF ch.8.8 (optional).

**Written assignments - Not collected for grading:**

Remember that **some of those assignments will be relevant for the quizzes and exams.**

**(a)** Write from memory the following definitions and compare them with the MF lecture notes:

- CDF, PMF and PDF.  Which ones apply to both random variables and random elements?  Which ones apply to discrete random variables?  Which ones to continuous random variables?
- MGF of a (discrete) random variable; Defined how?  What is the role of  $\delta > 0$ ?
- How do you compute  $E[Y^{13}]$  from  $m_Y(t)$ ?
- If  $g : \mathbb{R} \rightarrow \mathbb{R}$ , what is  $E[g \circ Y]$   if  $Y$  is discrete  if  $Y$  is continuous (with a PDF  $f_Y(y)$ )
- When is  $E \left[ \sum_{j=1}^n Y_j \right] = \sum_{j=1}^n E[Y_j]$ ? • When is  $Var \left[ \sum_{j=1}^n Y_j \right] = \sum_{j=1}^n Var[Y_j]$ ?
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**(b)** Do the new exercises 6.3 and 6.4 of MF ch.6. (New in MF ver.2024-02-21.)

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

- WMS ch.3.5 exercises: #3.67, 3.73, 3.75,
- WMS ch.3.7 exercises: #3.103, 3.105, 3.115
- WMS ch.3.8 exercises: #3.121, 3.127, 3.135