

# Homework 17

MATH 262

due 11:59pm on Wednesday, May 13

Write your solutions to the following problems clearly and neatly. Make sure to explain your reasoning and provide mathematical details that support your answers. For a few tips on writing solutions, see [this helpful guide for mathematical writing](#).

You may write or type your solutions electronically, or write them on paper and scan or photograph them. Either way, make sure your solutions are easy to read, in order, and clearly labeled. Upload a single PDF file containing your solutions to the [Homework 17](#) assignment on Moodle.

## Book Problems

- Section 4.6 #103, 104, 105 (pages 307–309)
- Section 4.9 #133, 135 (pages 331–332)

## Additional Problem

The total time  $X_1$  from arrival to completion of service at a fast-food restaurant and the time  $X_2$  spent waiting in line before arriving at the service window have a joint density function given by

$$f(x_1, x_2) = \begin{cases} e^{-x_1} & \text{if } 0 \leq x_2 \leq x_1 < \infty, \\ 0 & \text{otherwise.} \end{cases}$$

$Y = X_1 - X_2$  represents the time spent at the service window.

- Find the pdf of  $Y$ .
- Find  $E(Y)$ .

## Extra Credit Problem

Two friends bike to a cafe, arriving at a uniformly random time between 7am and 8am. Each person waits for  $t$  minutes, but then leaves if their friend does not arrive in that time. What should  $t$  be to ensure that the probability that the two friends meet is exactly 0.5?