

# Homework 17

Math 262

due 5:00pm on Monday, May 16

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. Upload a single 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  $E(Y)$ .