Homework 16

Math 262

Write your solutions to the following problems and turn them in to the homework mailbox (RMS level 3, near the fireplace) by 4:00pm on **Wednesday, December 11**.

Book Problems

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

Additional Problems

1. 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

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

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

   (a) Find the pdf of Y.

   (b) Find $E(Y)$.

2. X_1 and X_2 have joint density given by

$$f(x_1, x_2) = \begin{cases} x_1 + x_2 & \text{if } 0 \le x_1 \le 1 \text{ and } 0 \le x_2 \le 1, \\ 0 & \text{otherwise.} \end{cases}$$

   Let $Y = \dfrac{X_1}{X_2}$. What is the density of Y?

Extra Credit Problem

Two 2-digit numbers and are formed by randomly selecting digits, without replacement, from the digits $1, 2, \ldots, 9$. What is the expected value of the product of the two numbers?