AM 1650: Homework # 5 (due Oct 25)

The book we refer to is Wackerly, Mendenhall & Scheaffer, Mathematical Statistics with Applications (6th Edition).

- Read Chapter 5 (skip Section 5.10).
- Solve problems 4.46, 4.47, 4.50, 4.60, 4.77.
- Solve problems 4.142. Also answer the following questions. Given that the applicant with an 8:15AM appointment has to wait,
  1. What is the probability that the waiting time is more than 20 minutes?
  2. What the expected value of the waiting time?
- Calculate the following two-dimensional integrals

\[ \iint_D f(x, y) \, dx \, dy. \]

1. \( D = \{(x, y): 0 \leq x \leq 1, \ 0 \leq y \leq 1\}, \) and \( f(x, y) = x + y + xy. \)
2. \( D = \{(x, y): 0 \leq x \leq 1, \ y - x \leq 1\}, \) and \( f(x, y) = xe^y. \)
3. \( D = \{(x, y): x^2 + y^2 \leq 1, \ y \geq 0\}, \) and \( f(x, y) = y. \)
4. \( D = \{(x, y): 0 \leq x \leq y, \ x + y \geq 2\}, \) and \( f(x, y) = e^{-(x+y)}. \) Hint: Split domain \( D \) into two pieces.
5. \( D = \{(x, y): |x| + |y| \leq 1\}, \) and \( f(x, y) = 2. \) Hint: You do not need to go through integrals since \( f \) is a constant.