1a. Problem 4.2. 15 a,b,e
b. Problem 4.3. 30 a,b
c. Problem 4.3. 36a

2a. Problem 4.4 66 a b
b. Problem 4.4 61 a

c. The quantity \( \frac{\rho_{XY}}{\sigma_X} \) is the minimum of what least squares problem (see class notes)?

   Show work.

3a Let \( X_1 \) and \( X_2 \) be independent random variables with pdf’s \( f_1(x_1) = 2x_1, \ 0 < x_1 < 1 \)
   and \( f_2(x_2) = 4x_2^3, \ 0 < x_2 < 1 \). Find \( P((0.4 < X_1 < .8) \cap (0.4 < X_2 < 1)) \)

b. Problem 5.1. 5

4 Let \( f(x, y) = c0 \leq x \leq 1, \ x^3 \leq y \leq 1. \)
   a. Find \( c \) so that \( f \) is a joint pdf
   b. Find the marginals.
   c. Find \( P(1/2 < X, 1/2 < Y) \)
   d. Find Cov(X,Y)