

Math 201, Spring 2022

Problem Set # 9

Due April 8, 2022 at 11:59pm on gradescope

Question 1. Let the random variables X, Y have joint density function

$$f(x, y) = \begin{cases} 3(2-x)y, & \text{if } 0 < y < 1 \text{ and } y < x < 2-y \\ 0, & \text{else.} \end{cases}$$

Find the marginal density functions f_X and f_Y .

Question 2. As in 1, let the random variables X, Y have joint density function

$$f(x, y) = \begin{cases} 3(2-x)y, & \text{if } 0 < y < 1 \text{ and } y < x < 2-y \\ 0, & \text{else.} \end{cases}$$

a) Compute $E[XY]$.

b) Calculate the probability $P(X + Y \leq 1)$.