

1. Let X and Y be discrete random variables with the following joint PF:

$$f(x, y) = \begin{cases} \frac{1}{7}(x - y)^2 & \text{for } x = 0, 1, 2 \text{ and } y = 0, 1 \\ 0 & \text{otherwise} \end{cases}$$

(a) Find $P(X = 1, Y = 0)$.

(b) Find $P(X \leq 1, Y = 0)$

(c) Find the marginal PF of X :

2. Let X and Y be continuous with the following joint PF:

$$f(x, y) = \begin{cases} \frac{3}{2}y^2 & \text{for } 0 \leq x \leq 2 \text{ and } 0 \leq y \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

(a) Find $P(X < 1, Y \geq \frac{1}{2})$

(b) Find $P(X > Y)$

(c) Find the marginal PF of Y :

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3. Suppose that X and Y are continuous rvs with the following joint CDF on the interval $(0,2)$ for both X and Y :

$$F(x, y) = \frac{1}{16}xy(x + y) \quad 0 < y < 2, 0 < x < 2$$

(a) Find $F_x(x)$

(b) Find the joint PF.

4. Let X be discrete and Y continuous with the following joint PF:

$$f(x, y) = \begin{cases} cy^x & \text{for } x = 0, 1, 2 \text{ and } 0 \leq y \leq 2 \\ 0 & \text{otherwise} \end{cases}$$

(a) Find c .