

$$f(x) = 3xy \Big|_0^x = 3x^2 \quad 0 \leq x \leq 1$$

(3)

$$f(x) = \begin{cases} 3x^2 & 0 \leq x \leq 1 \\ 0 & \text{dd} \end{cases}$$

$$f(y) = \int_y^1 3x \, dx \quad 0 \leq y \leq 1$$

$$= 3 \frac{x^2}{2} \Big|_y^1 = \frac{3}{2} - \frac{3y^2}{2} = \frac{3}{2}(1-y^2)$$

$$f(y) = \begin{cases} \frac{3}{2}(1-y^2) & 0 \leq y \leq 1 \\ 0 & \text{dd} \end{cases}$$

$f(x,y) \stackrel{?}{=} f(x) \cdot f(y) \begin{cases} \text{ise } x \text{ ve } y \text{ bağımsızdır.} \\ \text{değilse } x \text{ ve } y \text{ bağımsız değildir.} \end{cases}$

$$3x \neq (3x^2) \left(\frac{3}{2}(1-y^2) \right) \quad x \text{ ve } y \text{ rd. bağımsız değildir.}$$

$$c) \text{Cov}(X,Y) = E(XY) - E(X)E(Y)$$

$$E(XY) = \int_0^1 \int_0^x xy \cdot 3x \, dy \, dx = \int_0^1 \int_0^x 3x^2 y \, dy \, dx$$

$$= \int_0^1 3x^2 \frac{y^2}{2} \Big|_0^x \, dx = \int_0^1 \frac{3x^4}{2} \, dx = \frac{3x^5}{10} \Big|_0^1 = \frac{3}{10} //$$

$$E(X) = \int_0^1 x \cdot 3x^2 \, dx = 3 \frac{x^4}{4} \Big|_0^1 = \frac{3}{4}$$

$$E(Y) = \int_0^1 y \cdot \frac{3}{2}(1-y^2) \, dy = \frac{3}{2} \int_0^1 (y - y^3) \, dy = \frac{3}{2} \left[\frac{y^2}{2} - \frac{y^4}{4} \Big|_0^1 \right]$$

$$= \frac{3}{2} \left[\frac{1}{2} - \frac{1}{4} \right] = \frac{3}{2} \cdot \frac{1}{4} = \frac{3}{8}$$

$$\text{Cov}(X,Y) = \frac{3}{10} - \left(\frac{3}{4} \right) \left(\frac{3}{8} \right) = \frac{3}{10} - \frac{9}{32} = \frac{96-90}{320} = \frac{6}{320} > 0$$

X ve Y rd. arasında (+) ilişkili ualdır.