Two continuous random variables X and Y have the joint density $f_{X,Y}(x,y) = \frac{3}{4}\left(x^2+y^2\right)$ if $-1 < x < 1$ and $0 < y < 1$. Otherwise $f_{X,Y}(x,y) = 0$.

Find the expected value of the product, i.e., $\mathbb{E}[XY] = ?$.

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

15,00 Puan

- A 0
- B 1
- C 2
- D 3
- E 4

$$\int_{-1}^{1}\int_{0}^{1} x \cdot y \,\frac{3}{4}\left(x^2+y^2\right) dx\,dy$$

Let us given two random variables X and Y whose joint PDF is given by

$$f_{X,Y}(x,y) = \begin{cases} x+y, & \text{for } 0 \le x \le 1 \text{ and } 0 \le y \le 1 \\ 0, & \text{elsewhere} \end{cases}$$

Find the joint CDF of X and Y, i.e., $F_{X,Y}(x,y) = ?$.

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

15,00 Puan

A $F_{X,Y}(x,y) = \begin{cases} 1, & \text{for } x > 1 \text{ and } y > 1 \\ \frac{x^2y}{2} + \frac{xy^2}{2}, & \text{for } 0 \le x \le 1 \text{ and } 0 \le y \le 1 \\ 0, & \text{for } x < 0 \text{ and } y < 0 \end{cases}$

B $F_{X,Y}(x,y) = \begin{cases} 1, & \text{for } x > 1 \text{ and } y > 1 \\ \frac{x^2y}{2} + \frac{xy^2}{2}, & \text{for } 0 \le x \le 1 \text{ and } 0 \le y \le 1 \\ 0, & \text{for } x < 0 \text{ or } y < 0 \end{cases}$

C $F_{X,Y}(x,y) = \begin{cases} 1, & \text{for } x > 1 \text{ or } y > 1 \\ \frac{x^2y}{2} + \frac{xy^2}{2}, & \text{for } 0 \le x \le 1 \text{ and } 0 \le y \le 1 \\ 0, & \text{for } x < 0 \text{ or } y < 0 \end{cases}$

D $F_{X,Y}(x,y) = \begin{cases} 1, & \text{for } x > 1 \text{ or } y > 1 \\ \frac{x^2y}{2} + \frac{xy^2}{2}, & \text{for } 0 \le x \le 1 \text{ or } 0 \le y \le 1 \\ 0, & \text{for } x < 0 \text{ or } y < 0 \end{cases}$

E None of them.

$$\int_0^1 \int_0^1 x+y \, dy \, dx$$

$$\frac{x^2}{2} + \frac{yx}{2} \quad dy$$

$$\frac{x^2y}{2} + \frac{y^2x}{2}$$

A random variable X follows the PDF given by

$$f_X(x) = \begin{cases} \frac{3}{4}\left(1 - x^a\right), & \text{if } -1 \leq x \leq 1 \\ 0, & \text{elsewhere} \end{cases}$$

Find the value of the parameter "a".

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

14,00 Puan

A 2.5

B 2

C 1.5

D 1

E 0.5

$$\frac{3}{4}\int_{-1}^{1}\left(1 - x^a\right)dx$$

$$x\Big|_{-1}^{1} - \frac{x^{a+1}}{a+1}\Big|_{-1}^{1}$$

Let us assume we are given a random variable X whose CDF is given by

$$F_X(x) = \begin{cases} 0, & \text{if } -1 < x \\ 1/2, & \text{if } -1 \leq x < 0 \\ (1+x)/2, & \text{if } 0 \leq x < 1 \\ 1, & \text{if } 1 \geq x \end{cases}$$

Accordingly, find $\Pr(X = 1)$.

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

14,00 Puan

A 0.5

B 0.4

C 0.2

D 0.1

E 0

Let X be a random variable. We have expected value $\mathbb{E}[X] = 20$ and variance $\mathrm{var}(X) = 25$. Which of the following is certainly true?

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

14,00 Puan

A $\Pr(|X - 30| > 10) \leq 0.20$

B $\Pr(|X - 20| > 10) \leq 0.25$

C $\Pr(|X - 30| > 10) \leq 0.05$

D $\Pr(|X - 20| > 10) \leq 0.95$

E $\Pr(|X - 30| > 10) \geq 0.25$

$$\Pr(|X - E[X]| > d) \leq \frac{\mathrm{Var}(X)}{d}$$

$$\Pr(|X - 20| > d) \leq \frac{25}{d^2}$$

Let us be given a joint Cumulative Distribution Function (CDF) for two random variables X and Y, that is

$$F_{X,Y}(x,y) = \begin{cases} 1 - \frac{1}{x^2 y^2}, & \text{for } x \geq 1 \text{ and } y \geq 1 \\ 0, & \text{elsewhere} \end{cases}$$

Which one of the following is correct about this joint distribution?

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

14,00 Puan

A It is a valid CDF.

B It is not a valid CDF.

C $F_{X,Y}(\infty, \infty) = 1$

D $F_{X,Y}(-\infty, -\infty) = 0$

E None of them is correct.

A soccer player converts 0.1 of kicks to goals, independently of any other goal kick. What is the probability that in a series of 3 goal kicks, at most one will be a goal?

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

14,00 Puan

P(G

A 0.582

B 0.618

C 0.716

D 0.832

E 0.972