

Suppose that $A \subset B$ and $B \subset A$. Which of the following is true?

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

☒ A

$$\Pr(A) = \Pr(B)$$

☐ B

$$\Pr(A) > \Pr(B)$$

☐ C

$$\Pr(A) < \Pr(B)$$

☐ D

$$\Pr(\overline{A}) < \Pr(\overline{B})$$

☐ E

None

Suppose that $A \subseteq B$. Which of the following is true?

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

$$\Pr(A) > \Pr(B)$$

B

$$\Pr(\overline{A}) \geq \Pr(\overline{B})$$

C

$$\Pr(A) = \Pr(B)$$

D

$$\Pr(B) = \Pr(\overline{B})$$

E

None

A room is enlightened by three fluorescent lamps that have independent sources whose failure (blackout) probabilities are $1/2$, $2/3$ and $3/4$ respectively. What is the probability that the room will be enlightened?

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

$1/8$

B

$1/4$

C

$1/2$

D

$3/4$

A sample space consists of 4 mutually exclusive and collectively exhaustive events, let say E_1 , E_2 , E_3 and E_4 . If we have

$$\Pr(E_1) = 2 \Pr(E_2) = 3 \Pr(E_3) = 1/2,$$

then find the probability $\Pr(E_3 \cup E_4)$.

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

1/12

B

1/8

Let X and Y be two random variables. Which ones of the following statements are correct?

- I. If X and Y are uncorrelated, then X and Y are independent of each other.
- II. If X and Y are uncorrelated, X and Y are inter-dependent.
- III. If X and Y are independent of each other, then X and Y are correlated with each other.
- IV. If X and Y are independent of each other, then X and Y are uncorrelated.

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

Only I

B

Only II

C

Only III

A traditional fair dice is rolled twice. What is the probability that six dots will come out exactly once?

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

$1/18$

B

$2/18$

C

$3/18$

D

$4/18$

E

$5/18$

Let X and Y be two random variables and have the following joint probability mass function:

$$\Pr(X = x \cap Y = y) = \begin{cases} \frac{1}{10} & \text{if } x = 1 \text{ and } y = 0 \\ \frac{2}{10} & \text{if } x = 1 \text{ and } y = 1 \\ \frac{3}{10} & \text{if } x = 2 \text{ and } y = 0 \\ \frac{4}{10} & \text{if } x = 2 \text{ and } y = 1 \end{cases}$$

Find the mean of the X random variable, i.e., the expression $\mathbb{E}[X]$, where $\mathbb{E}[\cdot]$ is the mean value (expected value) operator.

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan



A traditional fair dice is rolled twice. What is the probability that six dots will come out exactly once?

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5.00 Puan

A

$1/18$

B

$2/18$

C

$3/18$

D

$4/18$

Let X and Y be two independent random variables. Determine the variances of X and Y if $\text{Var}(3X - Y) = 4$ and $\text{Var}(X + 3Y) = 6$, where $\text{Var}(\cdot)$ denotes the variance operator.

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

$1/8$ and $1/8$

B

$1/4$ and $3/8$

C

$3/8$ and $5/8$

D

$1/2$ and $7/8$

Two tourists are together preparing a trip-plan for visiting four major historical places in the east of Turkey. It is obvious that the traveled distance and therefore the cost of the trip will depend on the order of cities in his trip plan. How many different travel plans (i.e., the trip cost) are possible?

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

2

B

4

C

6

D

12

Let X and Y be two independent discrete random variables whose PMFs are given as

x_k	1	2
$\Pr(X = x_k)$	0.6	0.4

y_k	0	2
$\Pr(Y = y_k)$	0.3	0.7

Determine the probability $\Pr(XY > 2)$.

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

0.12

Let $Y = X_1 + X_2 + \cdots + X_{100}$, where $X_i, i = 1, 2, 3, \dots, 100$ are identically distributed independent random variables whose PMF are given as

x_k	0	1
$\Pr(X_i = x_k)$	0.6	0.4

 for all random variables $X_i, i = 1, 2, 3, \dots, 100$

Determine the value of variance of Y .

Hint: Use binomial distribution to model the random variable Y .

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A single student is randomly selected from among all of those attended to the lecture. Assume students are either male or female. What do you think of the following claim? *“All students are either male or they are not. Therefore, the probability that the selected student is female is $1/4$.”*

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

If exactly $1/8$ of all students are male, then the claim is true.

B

If exactly $1/4$ of all students are male, then the claim is true.

C

If exactly $1/2$ of all students are male, then the claim is true.

D

If exactly $3/4$ of all students are male, then the claim is true.

Let A and B be such two events that $\Pr(A) = 0.4$, $\Pr(B) = 0.2$, and $\Pr(A \cup B) = 0.5$. Then, determine the conditional probability $\Pr(A \cap B|B)$.

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

0.1

B

0.2

C

0.3

D

0.4

Let X and Y be the number of failures in two computer labs in a given month. The joint distribution of X and Y is given in the table below. What is the probability distribution of total number of failures $Z = X + Y$?

$\Pr(X = x_m \cap Y = y_n)$	$x_1 = 0$	$x_2 = 1$
$y_1 = 0$	0.10	0.10
$y_2 = 0$	0.10	0.70

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

$\Pr(Z = 0) = 0.70$ and $\Pr(Z = 1) = 0.30$

B

$\Pr(Z = 0) = 0.10$ and $\Pr(Z = 1) = 0.90$

A

 $\Pr(Z = 0) = 0.70$ and $\Pr(Z = 1) = 0.30$

B

 $\Pr(Z = 0) = 0.10$ and $\Pr(Z = 1) = 0.90$

C

 $\Pr(Z = 0) = 0.10$, $\Pr(Z = 1) = 0.10$, and $\Pr(Z = 2) = 0.80$

D

 $\Pr(Z = 0) = 0.10$, $\Pr(Z = 1) = 0.20$, and $\Pr(Z = 2) = 0.70$

E

 $\Pr(Z = 0) = 0.10$, $\Pr(Z = 1) = 0.10$, $\Pr(Z = 2) = 0.10$ and $\Pr(Z = 2) = 0.70$

Suppose that B_1, B_2, B_3 form a partition of a sample space. Let A be an arbitrary set over the same sample space. Assume that

$$\Pr(A \cap B_1) = \Pr(A \cap B_2) = \Pr(A \cap B_3) = 0.2.$$

Find the probability $\Pr(A)$.

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

0

0.2

What is the value of constant $a \in \mathbb{R}^+$ in order for the expression given below to be PMF of a discrete random variable X .

$$\Pr(X = k) = (1 - e^{-2}) e^{-ak} \text{ for } k = 0, 1, 2, \dots, \infty$$

Hint: Use the equality $r^0 + r^1 + r^2 + \dots + r^k + \dots + r^\infty = 1/(1 - r)$ for $|r| < 1$

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

1/2

B

1

Let A and B be two independent events with $\Pr(A|B) = 0.3$ and $\Pr(B) = 0.6$. Then, find the probability $\Pr(A \cup B)$?

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

0.48

B

0.60

C

0.72

D

0.86

Let X be a discrete random variable whose PMF is given as

x_k	0	1
$\Pr(X = x_k)$	0.6	0.4

Determine the value of $\mathbb{E}[X/(X + 1)]$, where $\mathbb{E}[\cdot]$ is the mean value (expected value) operator.

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

1/2

B

1/3

In an experiment we roll two fair dice and observe two numbers X and Y . Then, determine the conditional probability $\Pr(X > 4 | Y \leq 1)$.

Soruyu boş bırakmak isterseniz işaretlediğiniz seçeneğe tekrar tıklayınız.

5.00 Puan

A

$1/6$

B

$1/2$