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NPTEL

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Courses » Probability and Statistics

Announcements

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Unit 4 - Week 2



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Course outline

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- Lecture 9: Conditional Probability
- Lecture 10: Independence of Events
- Lecture 11: Problems in Probability-I
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Assignment Solution

Assignment 2

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-02-13, 23:59 IST.

1) 1 point

Let A and B be two events with $P(A \cup B) = 0.6$, $P(A) = 0.5$ and $P(B) = 0.3$. Then

$P(A^c | B)$ equals

- a. $\frac{1}{2}$
- b. $\frac{1}{3}$
- c. $\frac{1}{4}$
- d. $\frac{1}{5}$

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

2) 1 point

An integer is chosen at random from the first 500 positive integers. Then the probability that the number chosen is divisible by 7 or 11 equals

- a. $\frac{11}{50}$
- b. $\frac{29}{125}$
- c. $\frac{26}{125}$
- d. $\frac{9}{50}$

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

3) 1 point

Each of n urns contains 4 white and 6 black balls, while another urn contains 6 white and 4 balls. An urn is chosen at random from the $(n+1)$ urns and two balls are drawn from it, both black. The probability that 6 white and 2 black balls remain in the chosen urn is $1/11$. Then the value of n is

- a. 2
- b. 3
- c. 4
- d. 5

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

4)

1 point

Let E and F be two events with $0 < P(E) < 1$, $0 < P(F) < 1$ and $P(E|F) > P(E)$. Which of the following statements is NOT correct?

- a. $P(F|E) > P(F)$
- b. $P(E|F^c) < P(E)$
- c. $P(F|E^c) > P(F)$
- d. $P(E^c|F) < P(E^c)$

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

5)

0 points

In a colony each family has at least two children. The probability that a randomly chosen family from this society has exactly k children is $\frac{4}{5} \left(\frac{1}{5}\right)^{k-2}$, $k = 2, 3, \dots$. Each child can be a boy or girl with equal probability. Then the probability that a randomly selected family has two boys is

- a. $\frac{250}{729}$
- b. $\frac{500}{729}$
- c. $\frac{521}{729}$
- d. $\frac{700}{729}$

- a
- b

- c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

6) Which of the following is not a valid cumulative distribution function? 1 point

$$\text{a. } F(x) = \begin{cases} 0, & \text{if } x < 0 \\ x, & \text{if } 0 \leq x \leq \frac{1}{2} \\ 1, & \text{if } x > \frac{1}{2} \end{cases}$$

$$\text{b. } F(x) = \begin{cases} 0, & \text{if } x < 0 \\ x, & \text{if } 0 \leq x < \frac{1}{2} \\ 1, & \text{if } x \geq \frac{1}{2} \end{cases}$$

$$\text{c. } F(x) = \begin{cases} 0, & \text{if } x < 0 \\ \frac{x^3}{27}, & \text{if } 0 \leq x < 3 \\ 1, & \text{if } x \geq 3 \end{cases}$$

$$\text{d. } F(x) = \begin{cases} 0, & \text{if } x \leq 0 \\ 1 - e^{-x}, & \text{if } x > 0 \end{cases}$$

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

7) A random variables X has the following probability mass functions 1 point

X	0	1	2	3	4	5
$P(X=x)$	0	$2k$	$3k$	$2k^2$	$4k$	$9k^2+k$

Find $P(X < 4)$.

- a. 0.622
 b. 0.378
 c. 0.528
 d. 0.471

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

8)

1 point

Out of $(2m+1)$ tickets numbered consecutively, three tickets are drawn at random. Find the probability that the numbers on the ticket form an arithmetical progression.

a. $\frac{3m^2+1}{(4m^2-1)}$

b. $\frac{3}{(4m^2-1)}$

c. $\frac{3m}{4m^2-1}$

d. $\frac{3m^2}{(4m^2-1)}$

a

b

c

d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

9)

1 point

Suppose 10% of men and 5% of women are colour-blind. A person is chosen at random and he/she is found to be colour-blind. What is the probability that the person is male? Assume men constitute 60% of the population.

a. $\frac{1}{2}$

b. $\frac{2}{3}$

c. $\frac{3}{4}$

d. $\frac{4}{5}$

a

b

c

d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

10)

1 point

If X is a continuous random variable with probability density function given by

$$f_X(x) = \begin{cases} kx(x+1), & 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}$$

Find $P\left(\frac{1}{4} \leq x \leq \frac{1}{2}\right)$.

- a. $\frac{1}{32}$
- b. $\frac{1}{16}$
- c. $\frac{3}{32}$
- d. $\frac{5}{32}$

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

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