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Courses » Probability and Statistics

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Unit 5 - Week 3

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Course outline

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Assignment 3

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

Due on 2019-02-20, 23:59 IST

1) Let the moment generating function of a random variable X be given by

1 point

$$M_X(t) = \frac{e^t}{3 - 2e^t}, \quad t < \log_e 3 - \log_e 2. \text{ Then } V(X) \text{ is equal to}$$

- a. 6
- b. 4
- c. 3
- d. 2

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

2) A discrete random variables X has the following probability mass function

1 point

X	0	1	2	3	4	5
$P(X = x)$	0	$\frac{2}{11}$	$\frac{3}{11}$	$\frac{2}{121}$	$\frac{4}{11}$	$\frac{20}{121}$

Determine the standard deviation of X .

- a. 1.07
- b. 1.42
- c. 2.02
- d. 3.56

- a
- b
- c
- d

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Week 11

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Assignment
Solution

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

$$f_X(x) = \begin{cases} ax, & -2 < x < 0 \\ bx, & 0 \leq x < 2 \\ 0, & \text{otherwise} \end{cases}$$

Let $E(X) = \frac{4}{3}$. Find the median of X .

- a. 1
- b. -1
- c. $\frac{1}{\sqrt{2}}$
- d. $\sqrt{2}$

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

4)

1 point

If a fair dice is tossed 3000 times, the tosses being independent of each other. Use Chebyshev's inequality to find a lower bound for the probability that the number of '1s' observed is between 470 and 530.

- a. 0.462
- b. 0.537
- c. 0.232
- d. 0.768

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

5)

1 point

A random point P is taken on a line segment AB of length $2a$. Find the expected value of $\text{Max}(AP, PB)$

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

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

6)

1 point

For a certain job, a candidate is sending many applications. He/she estimates there is a chance that an application will be successfully accepted. How many applications should he send out so that probability of at least one acceptance is at least 95%?

- a. 4
- b. 6
- c. 8
- d. 9

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

7)

1 point

The installation time, in hours, for a certain software module has pdf

$$f(x) = \begin{cases} k(1-x^3), & 0 < x < 1 \\ 0, & \text{otherwise.} \end{cases}$$

The value of $Var(X)$ is

- a. $\frac{7}{225}$
- b. $\frac{11}{225}$
- c. $\frac{14}{225}$
- d. $\frac{21}{225}$

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

8)

1 point

An electronic store has twenty TV sets. Five of these have some manufacturing defect. A customer randomly selects four TV sets. Find the probability that the sample will have exactly one defective (approximately).

- a. 0.81
- b. 0.72
- c. 0.47
- d. 0.35

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

9)

1 point

Let X follow a Binomial distribution with mean 8 and standard deviation 2. Find $P(X \geq 3)$.

- a. 0.0021
- b. 0.3652
- c. 0.7396
- d. 0.9979

- a

- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

10) Consider the probability density function

$$f_X(x) = \begin{cases} \frac{1}{\alpha^2} \left[1 - \frac{|x-\theta|}{\alpha} \right], & |x-\theta| \leq \alpha \\ 0, & \text{otherwise} \end{cases}$$

Find the median and variance of X .

- a. θ and $\frac{\alpha^4}{6}$
- b. θ and $\frac{\alpha^2}{6}$
- c. $\frac{\theta}{2}$ and $\frac{\alpha^4}{6}$
- d. $\frac{\theta}{2}$ and $\frac{\alpha^2}{6}$

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

1 point

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