

Practice Set

Question: Height under the probability distribution curve represents 1) Probability and 2) Density. Select the right answer

1 is for discrete RV and 2 is for Continuous RV

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Question: Which of the following shows memoryless property

Exponential

Normal

Std Normal

Poisson

Geometric Distribution

Question: The numbers in Matrices A and B could represent

	A	B	C
A	8.2	5.8	3.5
B	5.9	4.8	2.1
C	3.5	2.1	1.7

A.

	A	B	C
A	1.00	0.92	0.93
B	0.92	1.00	0.75
C	0.93	0.75	1.00

B.

Ans Covariance and correlation

Correlation and correlation

Correlation and covariance

Covariance and Covariance

Question:-The average number of faulty products produced by a machine is 4,300 acres per year, with a standard deviation of 750 acres. The distribution of the number of faulty products is normal. What is the probability that between 2,500 and 4,200 faulty products produced in any given year?

- a) 0.4402
- b) 0.5
- c) 1
- d) All of the mentioned

ANSWER: a

Question:- Amount of values lies between $\mu+2\sigma$ and $\mu-2\sigma$ in normal distribution

- a) less than 65%
- b) less than 80%
- c) More than 90%
- d) All of the mentioned

ANSWER: c

Question: If x is gaussian random variable the probability function follows

- a) $\tan(x)$
- b) $e^{-(x)^2}$
- c) $\log x$
- d) none

ANSWER: c

Question:-On increasing the variance in a Gaussian distribution

- a) Bell curve will flatten
- b) Bell curve will start converging towards origin
- c) Bell curve will change it's prperties
- d) none

ANSWER: a

Question:-Waiting time is uniformly distributed in some shop is 1 to 5 mins.
Probability of waiting between 2 to 3 mins.

- a) 0.50
- b) 0.75
- c) 0.25
- d) 0.20

ANSWER: c

Question:-Which of the following is NOT required of a binomial distribution

- (A) Each trial has exactly two outcomes.
- (B) There is a fixed number of trials.
- (C) Probability of success remains fixed for all trials.
- (D) There are more than 20 trials

answer: D

Question:-Mean = np and the standard deviation = \sqrt{npq} for

- (A) all probability distributions. answer: C
- (B) normal distributions.
- (C) binomial distributions.
- (D) none of the above

answer: C

Question:-The most frequently occurring value in a data set is called the

(A) mean. (B) median. (C) mode. (D) range

answer: C

Question:-Which is not true for normal distribution?

(A) It is bell shaped (B) Curve is symmetrical (C) Mean mode median is at same point (D) None

answer: d

Question: Given a binomial distribution of total n trials having probability of success denoted as p. Let k denotes the number of trials ranging between 0 to n. Which of the following is correct?

A) $\sum_{k=0}^n n_{C_k} = 2^{(nk)}$

B) $\sum_{k=0}^n n_{C_k} = 2^k$

C) $\sum_{k=0}^n n_{C_k} = n.k$

D) $\sum_{k=0}^n n_{C_k} = 2^{(n)}$

ANSWER: D

Question: Consider two fair coins each having possible outcomes as H or T. Sample space of flipping of these two coins is [HH, HT, TH, TT]. Let

U: {HH, HT}, first coin turns up heads

V: {HH, TH}, second coin turns up heads

W: {TT, HH}, both coins either turn heads or both coins turn tails

Which of the following is correct?

A) $P(U|V) = P(U)$

B) $P(U|V) = 1$

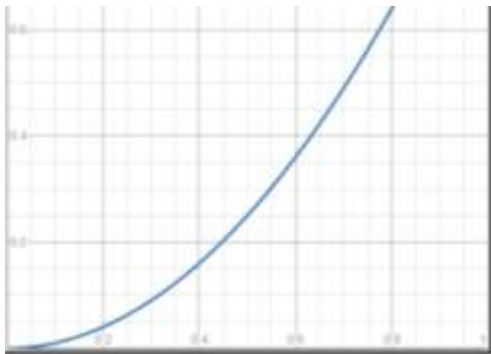
C) $P(U|V) = P(U).P(V)$

D) None of the above

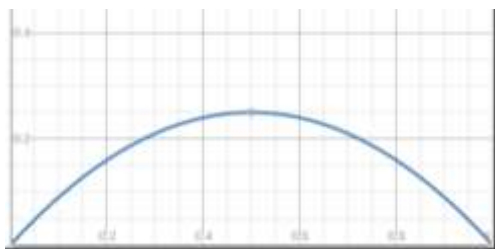
ANSWER: A

Question: Consider a random variable X belonging to Bernoulli distribution having probability of success denoted as p . Let Var denotes the variance of X . Which of the following curve represents the relation between p and Var given that p is represented on x-axis and Var on Y-axis on the curve?

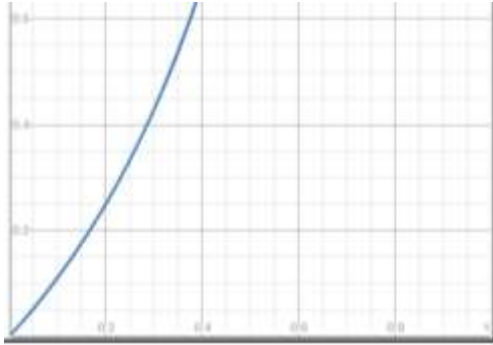
A)



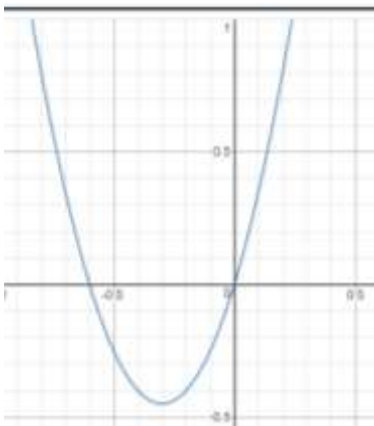
B)



C)



D)



ANSWER: B

Consider an experiment where first a fair 6-sided die is rolled and the number that turns up is recorded as X . Then, we flip a fair coin X times and recorded the number of times tail shows up as Y . Find the probability for $P(Y=3)$?

A) $1/6$

B) $5/8$

C) $3/8$

D) $1/8$

ANSWER: A

Question: A box contains 4 red balls, 6 green balls, and 8 black balls. Two balls are selected from the box at random. What is the conditional probability of choosing two black balls given the chosen balls are of same color?

A) $5/7$

B) $8/49$

C) $\frac{4}{7}$

D) $\frac{2}{49}$

ANSWER: C

Question: A rocket has four major components, each of which is required for its proper functioning. The rocket will crash if two or more components fail at the same time. Assuming each component can fail independently with the failure probability as 10^{-3} . What is the probability that the rocket will crash during a flight?

A) 10^{-16}

B) 10^{-9}

C) 10^{-12}

D) 10^{-5}

ANSWER: D

Question: Let X be the sum of numbers showing up on two dices when they are rolled. Find expectation of X .

A) 2

B) 3.5

C) 6.5

D) 7

ANSWER: D

Question: Suppose a kid takes 0.5 to 4 minutes (inclusive) of time to eat an ice-cream. Let X be the time in minutes, it takes the kid to eat an ice-cream. Then $X \sim U(0.5, 4)$. What is the probability that a different kid eat an ice-cream in more than 2 minutes given that the kid has already been eating it for more than 1.5 minutes?

A) $\frac{2}{5}$

B) $\frac{4}{5}$

C) $\frac{4}{7}$

D) None of the above

ANSWER: B

Question: There is a party in town and a taxi is arranged to pick up guests. The number of guests for taxi pickup is thought to be either 1, 2, 3, or 4, each with equal probability, and the number of gifts each guest is carrying is thought to be 1 or 2, with equal probability, independently for different guests. What is the probability that there will be six or more gifts?

A) 0.25

B) 0.3125

C) 0.2031

D) 0.03125

ANSWER: C

Question: Let X denotes number of bulb fluctuations in a minute which follows the Poisson distribution. The average number of fluctuations is 5 per minute. What is the average time between any two fluctuations?

A) 1

B) 5

C) $\frac{1}{5}$

D) $\frac{1}{10}$

ANSWER: C

Question: Two fair dice are rolled. What is the probability that the sum of numbers turned up on two dice is a multiple of 3, given that it is a multiple of 2?

A) $\frac{1}{2}$

B) $\frac{1}{4}$

C) $\frac{1}{6}$

D) $\frac{1}{3}$

ANSWER: D

Question: Consider a fair coin having probability of getting either heads or tails as 0.5. Suppose in a sequence of independent trials of coin tossing, getting a head is a successful outcome. What is the mean number of trials until two consecutive trials are successful?

- A) 10
- B) 12
- C) 4
- D) 6

ANSWER: D

Question: Suppose number of traffic signals on a road follows a Poisson process. Let 4 signals occur in distance of 2 km. What is the conditional probability that 0 signals occur in distance of 1 km?

- A) $1/2$
- B) $1/4$
- C) $1/16$
- D) Depends on value of λ , so cannot be estimated

ANSWER: C

Question: You are at a bus stop at 11 o'clock. The bus can arrive at any time between 11:00 and 11:30 with uniform distribution. Given that bus has not arrived till 11:15, what is the probability that you will have to wait for atleast additional 10 minutes?

- A) $1/3$
- B) 1
- C) $2/3$
- D) $1/6$

ANSWER: A

Question: A shopkeeper purchases 100 electric bulbs. He will test 10 of these bulbs and if 9 out of 10 are in working condition, he will keep all 100 bulbs. If the lot of 100 bulbs contains 20 defective bulbs, what is the probability that the bulbs lot will be kept?

A) 0.321

B) 0.259

C) 0.095

D) 0.363

ANSWER: D

Question: If the average number of wrong number calls handled daily by a person is 5, what proportion of days he will handle less than 3 wrong calls?

A) 12.5

B) 14

C) 2.5

D) 10

ANSWER: A