



Questions 1 – 2 refer to the following:

Below is the probability distribution function for the number of high school years that students at a local high school play on a sports team.

X	$P(X=x)$
0	0.32
1	0.12
2	?
3	0.18
4	0.14

Ex. 1

What is the probability that $X=2$?

- A. 0.24
- B. 0.76
- C. 0.32
- D. Cannot determine

Solution

A

Ex. 2

Over the long run, the average number of years that we would expect students at this high school to play on a sports team is:

- A. 0
- B. 1.7
- C. 2
- D. 2.6

Solution

B

Ex. 3

According to the 2000 United States Census, 12.3% of the population is Black or African American. The probability that a randomly selected U. S. resident is NOT Black or African American is:

- A. 0.123
- B. 0.877
- C. 0.754
- D. Cannot determine

Solution

B

Ex. 4

Assume the statistics final is a multiple choice test with 40 questions. Each question has four choices with one correct answer per question. If you were to randomly guess on each of the questions, what is the probability of getting exactly the expected number of correct answers?

- A. 0.5839
- B. 0.5605
- C. 0.25

- D. 0.1444

Solution

B

Ex. 5

In an exponential distribution, the mean is larger than the median.

- A. true
- B. false

Solution

B

Ex. 6

In Fall 1999, students in one Math 10 section determined that the length of movies at the cinema was normally distributed with a mean of 148 minutes and a standard deviation of 19 minutes. Find the third quartile and interpret it.

- A. 75 minutes; Three-fourths of the movie lengths fall below 75 minutes.
- B. 160.8 minutes; Three-fourths of the movie lengths fall below 160.8 minutes.
- C. 160.8; Three-fourths of the movies last 160.8 minutes.
- D. 75 minutes; Three-fourths of the movies last 75 minutes.

Solution

B

Ex. 7

Which of the following is FALSE about data that follows the normal distribution?

- A. The mean is the same as the mode.
- B. The standard deviation is the same as the mean.
- C. The median is the same as the mode.
- D. Most data is within 3 standard deviations of the median.

Solution

B

Ex. 8

The graph showing the age of getting a driver's license in California starts and peaks at age 16, and decreases from there. This shape most closely resembles what type of distribution?

- a. Normal
- b. Binomial
- c. Uniform
- d. Exponential

Solution

D

Use the following information for questions 9 and 10:

The amount of time that a randomly chosen 6th grade student spends on homework per week is uniformly distributed from 30 to 120 minutes.

Ex. 9

What is the probability that a randomly chosen 6th grade student spends at least 60 minutes per week on homework knowing that he/she will spend at most 80 minutes per week on homework?

- a. 1.20
- b. 0.6667
- c. 0.2222
- d. 0.4

Solution

D

Ex. 10

What is the expected amount of time that a randomly chosen 6th grade student spends on homework per week?

- a. 45 minutes
- b. 60 minutes
- c. 30 minutes
- d. 75 minutes

Solution

D

Use the following information for questions 11 and 12:

The length of time a randomly chosen 9-year old child spends playing video games per day is approximately exponentially distributed with a mean equal to 2 hours.

Ex. 11

Find the probability that a randomly chosen 9-year old will play video games at most 3 hours.

- a. 0.7769
- b. 0.9975
- c. 0.0025
- d. 0.2231

Solution

A

Ex. 12

70% of 9-year old children will play video games per day for at most how long?

- a. 0.60 hours
- b. 2.41 hours
- c. 0.71 hours
- d. Cannot determine

Solution

B

Use the following information for questions 13 and 14:

Research has shown that studying improves a student's chances to 80% of selecting the correct answer to a multiple choice question. A multiple choice test has 15 questions. Each question has 4 choices.

Ex. 13

What is the distribution for the number of questions answered correctly when a student studies?

- a. $B(15, 0.80)$
- b. $B(15, 0.25)$

- c. $P(15)$
- d. $P(6)$

Solution

A

Ex. 14

Suppose that a student does not study for the test but randomly guesses the answers. What is the probability that the student will answer 7 or 8 questions correctly?

- a. 0.2951
- b. 0.0524
- c. 0.0131
- d. Cannot determine

Solution

B

Ex. 15

A downtown hotel determined the probability of finding X taxicabs waiting outside the hotel anytime between 5 PM and midnight. The information is shown in the table.

X	$P(X)$
1	0.0667
2	0.1331
3	0.2000
4	0.2667
5	0.3333

What is the average number of taxicabs that are expected to be waiting outside the hotel anytime between 5 PM and midnight?

- a. 3.7
- b. 3
- c. 0
- d. 15

Solution

A

Ex. 16

. During the registration period for a new quarter, the De Anza College Registrar’s Office processes approximately 75 applications per hour, on the average. What is the probability that it will process more than 80 applications for a randomly chosen hour? (This is a Poisson problem. If you did not cover the Poisson Distribution, then skip this problem.)

- a. 0.0379
- b. 0.2589
- c. 0.7411
- d. 0.0248

Solution

B

Questions 17 - 19 refer to the following:

$$P(T) = 0.69 \quad P(S) = 0.5, \quad P(S|T) = 0.5$$

Ex. 17

Events S and T are:

- a. mutually exclusive
- b. independent
- c. mutually exclusive and independent
- d. neither mutually exclusive nor independent

Solution

B

Ex. 18

Find $P(S \text{ AND } T)$

- a. 0.3450
- b. 0.2500
- c. 0.6900
- d. 1

Solution

A

Ex. 19

Find $P(S \text{ OR } T)$

- a. 0.6900
- b. 1.19
- c. 0.8450
- d. 0

Solution

C

Ex. 20

Based on data from the US Census Bureau the average age of US residents is 36.31 with a standard deviation of 21.99. The data is normally distributed. The notation for the distribution is:

- a. $X \sim N(36.31, 21.99)$
- b. $X \sim N(21.99, 36.31)$
- c. $X \sim B(36.31, 22)$
- d. $X \sim U(0, 36.31)$

Solution

A

Ex. 21

In a binomial distribution we:

- a. count the number of successes until a failure is obtained
- b. count the number of trials until a success is obtained
- c. count the number of successes in a finite number of trials
- d. count the number of trials until the number of successes equals the number of failures

Solution

C

Ex. 22

Certain stocks have a probability of 0.6 of returning a \$100 profit. They also have a probability of 0.4 of having a loss of \$300. Over the long run, what is the best thing to do to maximize your profit, and why?

- a. Invest in the stocks because there is a greater probability of making money than losing money.
- b. Do not invest in the stocks because the dollar amount for each loss is greater than the dollar amount for each gain.
- c. Invest in the stocks because making \$100 per stock is preferred to losing \$300 per stock.
- d. Do not invest in the stocks because the expected value is a loss.

Solution

D

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Questions 23 - 27 refer to the following table :

	American Indian	Asian/Pacific Islander	Black	Hispanic	White	Undeclared	Total
Administrator	0	3	5	5	21	0	34
Staff	1	35	21	30	201	16	304
Faculty	3	58	14	45	141	17	278
Total	4	96	40	80	363	33	616

Suppose that one De Anza College employee is randomly selected.

Ex. 23

Find P (the employee is an Administrator)

- **a:** 278/34
- **b:** 304/616
- **c:** 34/616
- **d:** 80/616

Solution

C

Ex. 24

Find P (the employee is Faculty AND American Indian)

- **a:** 382/616
- **b:** 3/616
- **c:** 3/4
- **d:** 3/278

Solution

B

Ex. 25

Find P (employee is Staff OR Hispanic)

- a. 384/616
- b. 80/616
- c. 304/616
- d. 354/616

Solution

D

Ex. 26

Find P (employee is an Administrator GIVEN the employee is Black)

- a. 40/616
- b. 5/34
- c. 5/616
- d. 5/40

Solution

D

Exercise 27

Being an Administrator and an American Indian are

- a. mutually exclusive events
- b. independent events
- c. mutually exclusive and independent events

- d. neither mutually exclusive nor independent events

Solution

A

Questions 28 - 31 refer to the following:

When a customer calls the "Help Line" at ABC Computer Software Co., the amount of time that a customer must wait "on hold" until somebody answers the line and helps the customer follows an exponential distribution with mean of 7.5 minutes.

Ex. 28

What is the probability that a customer waits more than 10 minutes to receive help?

- a. 0.2636
- b. 0.75
- c. 0.7364
- d. 0

Solution

A

Ex. 29

What is the 40th percentile of wait times for customers calling the help line?

- a. 6.87 minutes
- b. 3.83 minutes
- c. 0.68 minutes
- d. 0.122 minutes

Solution

B

Ex. 30

The customer wait time that is 1 standard deviation above the mean is:

- a. 2.17 minutes
- b. 7.5 minutes
- c. 9.67 minutes
- d. 15 minutes

Solution

D

Ex. 31

The probability that a customer calling the help line waits exactly 6 minutes for help:

- a. 0
- b. 0.45
- c. 0.55
- d. 0.8

Solution

A

Questions 32 – 34 refer to the following:

ABC Delivery Service offers next day delivery of packages weighing between 2 and 20 pounds in a certain city. They have found that the weights of the packages they deliver are uniformly distributed between 2 and 20 pounds.

Ex. 32

What is the probability that a package weighs between 10 and 15 pounds?

- a. 0.2778
- b. 0.5556
- c. 0.2500
- d. 0.8333

Solution

A

Ex. 33

Given that a package weighs less than 10 pounds, what is the probability that it weighs less than 5 pounds?

- a. 0.1667
- b. 0.6250
- c. 0.3750
- d. 0.5000

Solution

C

Ex. 34

35% of packages weigh less than how many pounds?

- a. 7.8 pounds
- b. 8.3 pounds
- c. 11.7 pounds
- d. 13.7 pounds

Solution

B

Ex. 35

Suppose that the probability that an adult in California will watch a Giant's World Series game is 65%. Each person is considered independent. Of interest, is the number of adults in California we must survey until we find one who will watch a Giant's World Series game. What is the probability that you must ask 2 or 3 people? (This is a geometric problem. If you did not cover the geometric distribution, then skip this problem.)

- a. 0.6500
- b. 0.3071
- c. 0.2275
- d. 0.0796

Solution

B

Questions 36– 38 refer to the following:

The amount of time De Anza students work per week is approximately normally distributed with mean of 18.17 hours and a standard deviation of 12.92 hours.

Ex. 36

The median is:

- a: Not enough information
- b: 12.92
- c: 2.0
- d: 18.17

Solution

D

Ex. 37

The 90th percentile for the amount of time De Anza students work per week is:

- a. 1.61
- b. 18.17
- c. 90
- d. 34.7

Solution

D

Ex. 38

Which of the following is NOT TRUE about the normal distribution?

- a. the mean, median and mode are equal
- b. the curve is skewed to the right
- c. the curve never touches the x-axis

- d. the area under the curve is one.

Solution

B

Ex. 39

We use the z-score to:

- a. compare normal distributions with different averages and standard deviations
- b. drive statistics students nuts
- c. compare exponential distributions with the same average
- d. compare uniform distributions with different minimum and maximum numbers

Solution

A

With My Best Regards

Dr. M. Kayid



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