

You need Scantron 882E. Please use a pencil to mark the answers. Make sure your Scantron is clean, flat, and not folded when you submit.

Provide an appropriate response.

1) Given that $P(A \text{ or } B) = \frac{1}{2}$, $P(A) = \frac{1}{3}$, and $P(A \text{ and } B) = \frac{1}{9}$, find $P(B)$. 1) _____

- A) $\frac{13}{18}$ B) $\frac{17}{18}$ C) $\frac{5}{18}$ D) $\frac{7}{27}$

2) The distribution of Master's degrees conferred by a university is listed in the table. 2) _____
Assume that a student majors in only one subject.

Major	Frequency
Mathematics	221
English	207
Engineering	86
Business	176
Education	222

What is the probability that a randomly selected student with a Master's degree majored in English Mathematics? Round your answer to three decimal places.

- A) 0.242 B) 0.469 C) 0.227 D) 0.531

3) The table lists the smoking habits of a group of college students. 3) _____

Sex	Non-smoker	Regular Smoker	Heavy Smoker	Total
Man	135	47	5	187
Woman	187	21	5	213
Total	322	68	10	400

If a student is chosen at random, find the probability of getting someone who is a regular or heavy smoker. Round your answer to three decimal places.

- A) 0.667 B) 0.130 C) 0.195 D) 0.224

4) One hundred people were asked, "Do you favor the death penalty?" Of the 33 that answered "yes" to the question, 14 were male. Of the 67 that answered "no" to the question, six were male. If one person is selected at random, what is the probability that this person answered "yes" or was a male? 4) _____

- A) 0.67 B) 0.13 C) 0.53 D) 0.39

Classify the following random variable according to whether it is discrete or continuous.

5) the heights of the bookcases in a school library 5) _____
A) discrete B) continuous

6) the pressure of water coming out of a fire hose 6) _____
A) continuous B) discrete

7) the number of goals scored in a hockey game 7) _____
A) continuous B) discrete

- 8) the speed of a car on a New York tollway during rush hour traffic 8) _____
 A) discrete B) continuous

Provide an appropriate response.

- 9) Consider the discrete probability distribution to the right when answering the following question. 9) _____
 Find the probability that x equals 5.

x	3	5	6	8
P(x)	0.11	?	0.02	0.12

- A) 0.25 B) 1.25 C) 3.75 D) 0.75

- 10) Given the table of probabilities for the random variable x, does this form a probability distribution? 10) _____
 Answer Yes or No.

x	0	1	2	3	4
P(x)	0.02	0.07	0.22	0.27	0.42

- A) Yes B) No

- 11) Calculate the mean for the discrete probability distribution shown here. 11) _____

x	3	6	7	11
P(x)	0.15	0.19	0.26	0.4

- A) 6.75 B) 27 C) 1.9525 D) 7.81

- 12) The produce manager at a farmer's market was interested in determining how many oranges a person buys when they buy oranges. He asked the cashiers over a weekend to count how many oranges a person bought when they bought oranges and record this number for analysis at a later time. The data is given below in the table. The random variable x represents the number of oranges purchased and P(x) represents the probability that a customer will buy x apples. Determine the mean number of oranges purchased by a customer. 12) _____

x	1	2	3	4	5	6	7	8	9	10
P(x)	0.05	0.19	0.20	0.25	0.12	0.10	0	0.08	0	0.01

- A) 5.50 B) 3 C) 3.97 D) 4

- 13) A local bakery has determined a probability distribution for the number of cheesecakes that they sell given day. The distribution is as follows: 13) _____

Number sold in a day	0	5	10	15	20
Prob (Number sold)	0.08	0.14	0.1	0.25	0.43

Find the number of cheesecakes that this local bakery expects to sell in a day.

- A) 14.05 B) 14.13 C) 14.45 D) 10

- 14) True or False: The expected value of a discrete probability distribution may be negative. 14) _____
 A) True B) False

- 15) If p is the probability of success of a binomial experiment, then the probability of failure is 15) _____
 A) 1 - p B) $\frac{x}{n}$ C) $\frac{n}{x}$ D) -p

- 16) In a recent survey, 66% of the community favored building a health center in their neighborhood. If 14 citizens are chosen, find the probability that exactly 9 of them favor the building of the health center. 16) _____
 A) 0.660 B) 0.643 C) 0.015 D) 0.216
- 17) According to insurance records a car with a certain protection system will be recovered 92% of the time. Find the probability that 3 of 7 stolen cars will be recovered. 17) _____
 A) 0.92 B) 0.429 C) 0.08 D) 0.001
- 18) The probability that a house in an urban area will develop a leak is 2%. If 17 houses are randomly selected, what is the probability that none of the houses will develop a leak? 18) _____
 A) 0.020 B) 0.001 C) 0.709 D) 0.000
- 19) Assume that male and female births are equally likely and that the birth of any child does not affect the probability of the gender of any other children. Find the probability of at most three girls in ten births. 19) _____
 A) 0.172 B) 0.300 C) 0.003 D) 0.333
- 20) A quiz consists of 10 true or false questions. To pass the quiz a student must answer at least eight questions correctly. If the student guesses on each question, what is the probability that the student will pass the quiz? 20) _____
 A) 0.20 B) 0.08 C) 0.055 D) 0.8
- 21) A quiz consists of 10 multiple choice questions, each with five possible answers, one of which is correct. To pass the quiz a student must get 60% or better on the quiz. If a student randomly guesses, what is the probability that the student will pass the quiz? 21) _____
 A) 0.006 B) 0.205 C) 0.377 D) 0.060
- 22) According to government data, the probability that an adult was never in a museum is 15%. In a random survey of 10 adults, what is the probability that two or fewer were never in a museum? 22) _____
 A) 0.002 B) 0.820 C) 0.800 D) 0.200
- 23) According to the Federal Communications Commission, 70% of all U.S. households have vcrs. In a random sample of 15 households, what is the probability that at least 13 have vcrs? 23) _____
 A) 0.5 B) 0.8732 C) 0.1268 D) 0.7
- 24) According to the Federal Communications Commission, 70% of all U.S. households have vcrs. In a random sample of 15 households, what is the probability that the number of households with vcrs is between 10 and 12, inclusive? 24) _____
 A) 0.4053 B) 0.7 C) 0.2061 D) 0.5947
- 25) A quiz consists of 980 true or false questions. If the student guesses on each question, what is the mean number of correct answers? 25) _____
 A) 980 B) 0 C) 490 D) 196
- 26) A quiz consists of 390 true or false questions. If the student guesses on each question, what is the standard deviation of the number of correct answers? 26) _____
 A) 9.8742088 B) 2 C) 0 D) 13.96424

- 27) A quiz consists of 100 multiple choice questions, each with five possible answers, only one of which is correct. Find the mean and the standard deviation of the number of correct answers. 27) _____
 A) mean: 20; standard deviation: 4.47213595 B) mean: 50; standard deviation: 4
 C) mean: 20; standard deviation: 4 D) mean: 50; standard deviation: 7.07106781
- 28) In a recent survey, 80% of the community favored building a health center in their neighborhood. If 15 citizens are chosen, what is the mean number favoring the health center? 28) _____
 A) 12 B) 8 C) 15 D) 10
- 29) The probability that a house in an urban area will develop a leak is 5%. If 20 houses are randomly selected, what is the mean of the number of houses that developed leaks? 29) _____
 A) 1 B) 2 C) 0.5 D) 1.5
- 30) The normal density curve is symmetric about 30) _____
 A) An inflection point
 B) Its mean
 C) The horizontal axis
 D) A point located one standard deviation from the mean
- 31) The area under a standard normal density curve with mean of 0 and standard deviation of 1 is 31) _____
 A) $\mu + 2(3\sigma)$ B) 1 C) $\mu + 3\sigma$ D) infinite
- 32) Approximately ____% of the area under the normal curve is between $\mu - \sigma$ and $\mu + \sigma$. 32) _____
 A) 99.7 B) 95 C) 68 D) 50
- 33) Find the area under the standard normal curve between $z = 1$ and $z = 2$. 33) _____
 A) 0.1359 B) 0.8413 C) 0.5398 D) 0.2139
- 34) Find the area under the standard normal curve to the left of $z = 1.5$. 34) _____
 A) 0.5199 B) 0.7612 C) 0.9332 D) 0.0668
- 35) Find the area under the standard normal curve between $z = -1.5$ and $z = 2.5$. 35) _____
 A) 0.9831 B) 0.6312 C) 0.9270 D) 0.7182
- 36) Find the area under the standard normal curve to the right of $z = -1.25$. 36) _____
 A) 0.7193 B) 0.5843 C) 0.8944 D) 0.6978
- 37) Given a distribution that follows a standard normal curve, what does the graph of the curve do as z increases in the positive direction? 37) _____
 A) The graph of the curve approaches an inflection point.
 B) The graph of the curve approaches 1.
 C) The graph of the curve approaches zero.
 D) The graph of the curve eventually intersects the horizontal axis.

Suppose that prices of a certain model of new homes are normally distributed with a mean of \$150,000. Find the percentage of buyers who paid:

- 38) between \$147,700 and \$152,300 if the standard deviation is \$2300. 38) _____
 A) 68% B) 34% C) 99.7% D) 95%

Provide an appropriate response.

- 39) A physical fitness association is including the mile run in its secondary-school fitness test. The time for this event for boys in secondary school is known to possess a normal distribution with a mean of 440 seconds and a standard deviation of 60 seconds. Find the probability that a randomly selected boy in secondary school can run the mile in less than 302 seconds. 39) _____
A) 0.5107 B) 0.4893 C) 0.0107 D) 0.9893
- 40) A physical fitness association is including the mile run in its secondary-school fitness test. The time for this event for boys in secondary school is known to possess a normal distribution with a mean of 470 seconds and a standard deviation of 50 seconds. Find the probability that a randomly selected boy in secondary school will take longer than 355 seconds to run the mile. 40) _____
A) 0.0107 B) 0.5107 C) 0.4893 D) 0.9893
- 41) Suppose a brewery has a filling machine that fills 12 ounce bottles of beer. It is known that the amount of beer poured by this filling machine follows a normal distribution with a mean of 12.16 ounces and a standard deviation of 0.04 ounce. Find the probability that the bottle contains fewer than 12.06 ounces of beer. 41) _____
A) 0.9938 B) 0.5062 C) 0.0062 D) 0.4938
- 42) Suppose a brewery has a filling machine that fills 12 ounce bottles of beer. It is known that the amount of beer poured by this filling machine follows a normal distribution with a mean of 12.14 ounces and a standard deviation of 0.04 ounce. Find the probability that the bottle contains more than 12.14 ounces of beer. 42) _____
A) 0.5 B) 0.4 C) 0 D) 1
- 43) Suppose a brewery has a filling machine that fills 12 ounce bottles of beer. It is known that the amount of beer poured by this filling machine follows a normal distribution with a mean of 12.48 ounces and a standard deviation of 0.04 ounce. Find the probability that the bottle contains between 12.38 and 12.44 ounces. 43) _____
A) 0.1649 B) 0.8475 C) 0.1525 D) 0.8351
- 44) The length of time it takes college students to find a parking spot in the library parking lot follows a normal distribution with a mean of 6.5 minutes and a standard deviation of 1 minute. Find the probability that a randomly selected college student will find a parking spot in the library parking lot in less than 6.0 minutes. 44) _____
A) 0.2674 B) 0.3085 C) 0.1915 D) 0.3551
- 45) The length of time it takes college students to find a parking spot in the library parking lot follows a normal distribution with a mean of 5.5 minutes and a standard deviation of 1 minute. Find the probability that a randomly selected college student will take between 4.0 and 6.5 minutes to find a parking spot in the library lot. 45) _____
A) 0.4938 B) 0.2255 C) 0.0919 D) 0.7745
- 46) The tread life of a particular brand of tire is a random variable best described by a normal distribution with a mean of 60,000 miles and a standard deviation of 1400 miles. What is the probability a certain tire of this brand will last between 57,060 miles and 57,480 miles? 46) _____
A) 0.4649 B) 0.4920 C) 0.9813 D) 0.0180

- 47) A physical fitness association is including the mile run in its secondary-school fitness test. The time for this event for boys in secondary school is known to possess a normal distribution with a mean of 450 seconds and a standard deviation of 50 seconds. The fitness association wants to recognize the fastest 10% of the boys with certificates of recognition. What time would the boys need to beat in order to earn a certificate of recognition from the fitness association? 47) _____
A) 367.75 sec B) 514 sec C) 386 sec D) 532.25 sec
- 48) The amount of corn chips dispensed into a 16-ounce bag by the dispensing machine has been identified as possessing a normal distribution with a mean of 16.5 ounces and a standard deviation of 0.2 ounce. What chip amount represents the 67th percentile for the bag weight distribution? 48) _____
A) 16.59 oz B) 16.09 oz C) 16.13 oz D) 16.63 oz
- 49) The length of time it takes college students to find a parking spot in the library parking lot follows a normal distribution with a mean of 4.5 minutes and a standard deviation of 1 minute. Find the cut-off time which 75.8% of the college students exceed when trying to find a parking spot in the library parking lot. 49) _____
A) 5.0 min B) 4.8 min C) 5.2 min D) 5.3 min
- 50) A new phone system was installed last year to help reduce the expense of personal calls that were being made by employees. Before the new system was installed, the amount being spent on personal calls follows a normal distribution with an average of \$800 per month and a standard deviation of \$50 per month. Refer to such expenses as PCE's (personal call expenses). Find the point in the distribution below which 2.5% of the PCE's fell. 50) _____
A) \$20.00 B) \$702.00 C) \$898.00 D) \$780.00