The population is

A. A collection of observations.

B. A collection of methods for planning studies and experiments.

C. The complete collection of all elements.

D. A sub collection of members drawn from a larger group. C

A self-selected study is a source of bias in which factor of statistical analysis?

A. Source of the data.

B. Context of the data.

C. Mathematical calculations.

D. Sampling method. D

Which is an example of quantitative data?

A. Weights of high school students.

B. Genders of actors and actresses.

C. Colors of the rainbow.

D. Consumer ratings of a particular automobile (below average, average, and above average). A

Which is not an example of continuous data?

A. Temperature on a thermometer.

B. Number of students in an algebra class.

C. Mean weight of 100 flour sacks.

D. Amount of water pumped from a pond per day. B

Questions on a survey are scored with integers 1 thru 5 with 1 representing Strongly Disagree and 5 Strongly Agree. This is an example of what kind of measurement?

A. Nominal.

B. Ratio.

C. Ordinal.

D. Interval. C

In a large lecture room class of 300 students, a sample of 10 was taken to determine the male/female make up of the

class. Which misuse of statistics does this represent?

A. Percentages.

B. Precise numbers.

C. Missing data.

D. Small samples. D

At a security checkpoint to a government facility, every 10th individual was more thoroughly searched than the others. What

type of sampling is this?

A. Systemic.

B. Convenience.

C. Stratified.

D. Cluster. A

Casualty data from the great flu epidemic of 1918 were collected for a study. This represents what type of study?

A. Cross-sectional.

B. Retrospective.

C. Prospective.

D. Qualitative B

A sample value that lies very far away from the majority of the other sample values is

A. the center.

B. a distribution.

C.an outlier.

D. a variance. C

A table that lists data values along with their counts is

A. an ogive.

B. a frequency distribution.

C.a cumulative table.

D. a histogram. B

The smallest numbers that can actually belong to different classes are

A. upper class limits.

B. class boundaries.

C. midpoints.

D. lower class limits. D

A bar graph where the horizontal scale represents the classes of quantitative data values and the vertical scale represents the frequencies is called

A. a frequency distribution.

B. a histogram.

C. a dot plot.

D. a pie chart. B

The pie chart below shows the percent of the total population of 12,200 of Springfield living in the given types of housing. Find the number of people who live in single family housing (round to nearest whole number.)

A. 4758 people

B. 39 people

C. 5368 people

D. 7442 people A

Drawings of objects used to depict data are called

A. scatterplots.

B. pictographs.

C. dot plots.

D. pie charts. B

Which measure of center is the only one that can be used with data at the nominal level of measurement?

A. Mean

B. Median

C. Mode C

Which of the following measures of center is not affected by outliers?

A. Mean

B. Median

C. Mode B

Find the mode for the given sample data.

79, 25, 79, 13, 25, 29, 56, 79

A. 79

B. 48.1

C. 42.5

D. 25 A

Which is not true about the variance?

A. It is the square of the standard deviation.

B. It is a measure of the spread of data.

C. The units of the variance are different from the units of the original data set.

D. It is not affected by outliers. D

Weekly sales for a company are $10,000 with a standard deviation of $450. Sales for the past week were $9050. This is

A. unusually high.

B. unusually low.

C. about right. B

In a data set with a range of 55.1 to 102.8 and

300 observations, there are 207 data points

with values less than 88.6. Find the

percentile for 88.6.

A. 32

B. 116.03

C. 69

D. 670 C

Which graphic display shows the least

detailed information?

A. Histogram

B. Stem-and-leaf plot

C. Boxplot C

Express the indicated degree of likelihood

as a probability value:

"There is a 40% chance of rain tomorrow."

A. 40

B. 0.60

C. 0.40

D. 4 C

A bag contains 6 red marbles, 3 blue marbles,

and 7 green marbles. If a marble is randomly

selected from the bag, what is the probability

that it is blue?

A. 1/3

B. 1/7

C. 3/16

D. 1/13 C

Assume that one student in a class of 27

students is randomly selected to win a prize.

Would it be "unusual" for you to win?

(Assume "unusual" is a probability less than

or equal to 0.05)

A. Yes

B. No A

A bag contains 8 red marbles, 4 blue marbles,

and 1 green marble. Find P(not blue).

A. 9/13

B. 9

C. 13/9

D. 4/13 A

If A and B are dependent events, then

P(A and B) is

A. P(A) • P(B|A)

B. P(A) • P(B)

C. P(A) • P(A|B) A

The following table contains data from a study of

two airlines which fly to Small Town, USA.

Number of on time flights

Number of late flights

Podunk Airlines

33

6

Upstate Airlines

43

5

One of the 87 flights is randomly selected. Find the

probability that the flight selected arrived on time

given that it was an Upstate Airlines flight.

A. 43/87

B. 11/76

C. 43/48

D. None of the above is correct. C

Find 10C2

A. 80,640

B. 40,320

C. 45

D. 5 C

Identify the given variable as being discrete

or continuous: the number of oil spills off

the Alaskan coast.

A. Continuous

B. Discrete B

Determine if the following is a probability

distribution.

X: 0 1 2 3 4 5

P(X): 0.243 0.167 0.213 0.149 0.232 0.164

A. Yes

B. No B

Find the mean of the given probability

distribution.

X: 0 1 2 3 4

P(X): 0.1296 0.3456 0.3456 0.1536 0.0256

A. 1.50

B. 1.73

C. 1.60

D. 2.00 C

A contractor is considering a sale that

promises a profit of $38,000 with a probability

of 0.7 or a loss (due to bad weather, strikes,

and such) of $16,000 with a probability of 0.3.

What is the expected profit?

A. $26,600

B. $22,000

C. $37,800

D. $21,800 D

Use the binomial probability formula to find the

probability of x successes in n trials given the

probability p of success on a single trial.

n = 12, x = 5, p = 0.25

A. 0.103

B. 0.082

C. 0.091

D. 0.027 A

The number of calls received by a car towing

service averages 16.8 per day (per 24 hour

period). After finding the mean number of

calls per hour, use a Poisson Distribution to

find the probability that in a randomly

selected hour, the number of calls is 2.

A. 0.08516

B. 0.13383

C. 0.12166

D. 0.15208 C

Assume that the weight loss for the first

month of a diet program varies between 6

pounds and 12 pounds, and is spread evenly

over the range of possibilities, so that there is

a uniform distribution. Find the probability of

losing less than 10 pounds.

A. 5/7

B. 2/3

C. 1/3

D. 1/6 B

A recent survey based upon a random sample

of 420 voters, predicted that the Independent

candidate for the mayoral election will get

24% of the vote, but he actually gets 27%.

Can you conclude that the survey was done

incorrectly?

A. Yes

B. No B

If Z is a standard normal variable, find the

probability that Z lies between 0.7 and 1.98.

A. 0.2175

B. -0.2181

C. 1.7341

D. 0.2181 D

A final exam in Math 160 has a mean of 73 with

a standard deviation of 7.8. If 24 students are

randomly selected, find the probability that the

mean of their test scores is less than 70.

A. 0.1006

B. 0.0301

C. 0.9699

D. 0.0278 C

For a normal distribution with n = 53 and p = .7,

state whether or not it is suitable to use the

normal distribution as an approximation to the

binomial distribution?

A. Normal approximation is not suitable.

B. Normal approximation is suitable. B

Find the critical value for zα/2 that corresponds

to a degree of confidence of 98%.

A. 2.575

B. 2.33

C. 1.75

D. 2.05 B

Find the margin of error for the 95%

confidence interval used to estimate the

population proportion with n = 163 and x = 96.

A. 0.0680

B. 0.0755

C. 0.132

D. 0.00291 B

459 randomly selected light bulbs were tested

in a laboratory, 291 lasted more than 500

hours. Find a point estimate of the true

proportion of all light bulbs that last more than

500 hours.

A. 0.632

B. 0.366

C. 0.388

D. 0.634 D

Use the confidence level and sample data to

find the margin of error E.

College students' annual earnings:

99% confidence, n = 74 x = $3967, σ = $874

A. $262

B. $9

C. $237

D. $1187 A

You want to be 95% confident that the sample

variance is within 40% of the population

variance. Find the appropriate sample size.

A. 224

B. 11

C. 14

D. 56 D

To find the standard deviation of the diameter

of wooden dowels, the manufacturer

measures 19 randomly selected dowels and

finds the standard deviation of the sample to

be s = 0.16. Find the 95% confidence interval

for the population standard deviation σ.

A. 0.13 < σ < 0.22

B. 0.12 < σ < 0.24

C. 0.11 < σ < 0.25

D. 0.15 < σ < 0.21 B

A researcher claims that 62% of voters favor

gun control. Identify the null hypothesis H0

and the alternative hypothesis H1.

A. H0: p < 0.62, H1: p ≥ 0.62

B. H0: p = 0.62, H1: p = 0.62

C. H0: p = 0.62, H1: p = 0.62

D. H0: p ≥ 0.62, H1: p < 0.62 B

Assume that the data have a normal

distribution and the number of observations is

greater than 50. Using α = 0.05 for a left-tailed

test, find the critical z value used to test the

null hypothesis.

A. -1.645

B. +/-1.96

C. +/-1.645

D. -1.96 A

Carter Motor Company claims that its new sedan, the

Libra, will average better than 30 miles per gallon in the

city. Identify the type I error of the test.

A. The error of failing to reject the hypothesis that the

mean is 30 miles per gallon when it is actually

greater than 30 miles per gallon.

B. The error of rejecting the hypothesis that the mean is 30 miles per gallon when it really is 30 miles per gallon.

C. The error of rejecting the hypothesis that the mean is more than 30 miles per gallon when it really is more than 30 miles per gallon. B

A medical school claims that more than 28%

of its students plan to go into general

practice. It is found that among a random

sample of 130 students, 32% of them plan

to go into general practice. Find the

P-value for a test of the school's claim.

A. 0.1539

B. 0.1635

C. 0.3078

D. 0.3461 A

Determine whether the hypothesis test

involves a sampling distribution of means that

is a normal distribution, Student t distribution

or neither. The sample data appear to come

from a normally distributed population with

σ = 28.

Claim: μ = 977.

Sample data: n = 25, x = 984, s = 25.

A. Student t

B. Neither

C. Normal C

Find the critical value or values of χ2 based

on the given information. H1: σ > 26.1, n = 9,

α = 0.01

A. 20.090

B. 21.666

C. 1.646

D. 2.088 A

Choose the error in the stated conclusion:

Given: There is a significant linear correlation between the number of homicides in a town and the number of movie theaters in a town.

Conclusion: Building more movie theaters will

cause the homicide rate to rise.

A. Correlation implies causality

B. Data based on averages

C. Property of linearity A

Four pairs of data yield r = 0.942 and the

regression equation y = 3x. Also y = 12.75.

What is the best predicted value of y for

x = 2.5?

A. 7.5

B. 2.826

C. 12.75

D. 0.942 C

Use the given data to find the equation of the

regression line.

X 2 4 5 6

Y 7 11 13 20

A. y = 3.0x

B. y = 0.15 + 3.0x

C. y = 2.8x

D. y = 0.15 + 2.8x A

Find the coefficient of determination, given

that the value of the linear correlation

coefficient, r, is -0.721.

A. 0.721

B. 0.520

C. 0.480

D. 0.279 B

The equation of the regression line for the

paired data below is y = 3x and the standard

error of the estimate is se = 2.2361. Find the

90% prediction interval of y for x = 3.

X 2 4 5 6

Y 7 11 13 20

A. 7.1 < y < 10.9

B. 6.8 < y < 11.2

C. 4.5 < y < 13.5

D. 1.2 < y < 16.8 D

Which one of the following statements is always true?

(A) The greater the value of the correlation coefficient, the stronger is the relationship.

(B) A strong positive correlation between two variables means one of the variables causes the effect of the other variable.

(C) If two variables are independent, their correlation does not exist.

(D) Pearson product-moment correlation coefficients numerically quantify only linear relationships. D

Which one of the following statements comparing correlation coefficients is true?

(A) 0.40 is stronger than 0.75.

(B) -0.50 is stronger than -0.95.

(C) 0.82 is weaker than 0.68.

(D) -0.54 is equal in strength to 0.54 D

The following correlation table shows the correlations between pairs of variables from among the four variables W, X, Y, and Z.

Correlation Table for Variables W, X, Y, and Z

Variable W Variable X Variable Y Variable Z

Variable W 1

Variable X -0.85 1

Variable Y 0.47 0.82 1

Variable Z -0.58 0.60 -0.79 1

The correlation coefficient between which of the following pairs of variables shows the strongest relationship?

(A) W and X

(B) Y and W

(C) X and Y

(D) Y and Z A

A biologist is interested in the relationship between age (in years) and the maximum pulse rate (in beats per minute) for women. A sample of five women yielded the following five pairs of data. Calculate the sample product-moment correlation coefficient r by formula. (Round your answer, as needed.)

Woman 1 Woman 2 Woman 3 Woman 4 Woman 5

Age x (years) 20 39 18 44 50

Pulse rate y (beats per minute) 210 180 200 165 120

(A) r = -0.904

(B) r = -0.749

(C) r = 0.904

(D) r = 0.749 A

The following data give the number of hours each of six students in a statistics class spent studying and each student's corresponding score (out of 100 points) on the final exam. Using a graphing calculator, calculate the product-moment correlation coefficient r for the sample. (Round your answer, as needed.)

Student Number 1 2 3 4 5 6

Study time x (in hours) 1.50 2.75 3.00 4.50 5.75 6.00

Score on exam y 54 73 70 82 91 89

(A) r = -0.969

(B) r = -0.939

(C) r = 0.939

(D) r = 0.969 D

In a simple linear regression model, which one of the following is NOT an assumption for the error terms?

(A) They are normally distributed.

(B) The variance is zero.

(C) The mean is zero.

(D) The variance is constant B

In a simple linear regression model, the estimator for the error variance is

(A) b0

(B) b1

(C) SSE

(D) MSE D

Which one of the following statements is NOT true?

(A) The least-squares regression line passes through the mean point ( x-bar, y- bar).

(B) Both correlation and regression analysis assume a linear model.

(C) In a regression analysis, the correlation coefficient and the slope of the regression equation have opposite arithmetic signs.

(D) In a regression analysis, the least-squares procedure finds the line that minimizes the sum of the squared errors from the line. C

A simple linear regression analysis yields the following results:

Yˆ = −5.2 − X0.75

p = 0.0325

r^2 = 0.81

Which of the following statements best interprets these results?

(A) The correlation between the dependent and independent variables is 0.9.

(B) The correlation between the dependent and independent variables is −0.75.

(C) Eighty-one percent of the time, the regression model will correctly predict values of the dependent variable.

(D) Eighty-one percent of the variation in Y is explained by the regression relationship of Y with X. D

A least-squares regression line predicting a girl's height using her shoe size as the independent variable is computed from 25 pairs of observations. The girls' heights are measured in centimeters, and the shoe sizes range from 4 to 9. A linear regression model ( p = 0.0435) yields the following prediction equation: Yˆ = 138.6412 + X4.4723 . Determine the predicted height (in centimeters) of a girl whose shoe size is 7. (Round your answer, as needed.)

(A) 138.6

(B) 68.7

(C) 169.9

(D) It is not appropriate to use the given prediction equation for a shoe size of 7. C

A linear regression model ( p = 0.0301) yields the following prediction

equation:

Yˆ = 36.2785 − X 1.3041

For each one-unit change in the independent variable, what is the estimated change in the mean value of the dependent variable?

(A) −1.3041

(B) 36.2785

(C) −36.2785

(D) 1.3041 A

Data from a sample of 50 paired observations of variables X and Y yield the least-squares regression line Y = − X ˆ 0.17 0.56 and a sample correlation of −0.70 between the two variables with p-value = 0.0004. According to these results, what is the proportion of variance in Y that is statistically explained by the regression equation?

(A) −0.70

(B) 0.49

(C) -0.56

(D) 0.17 B

What is the predicted GPA of a student who averages 10 hours of sleep per night? (Round your answer, as needed.)

(A) 3.73

(B) 3.48

(C) 4.00

(D) It is not appropriate to use the given prediction equation for x = 10 hours. D

What is the predicted GPA of a student who averages 6.5 hours of sleep per night? (Round your answer, as needed.)

(A) 3.02

(B) 3.12

(C) 3.08

(D) It is not appropriate to use the given prediction equation for x = 6.5 hours. A

A linear regression analysis on a data set of 12 ordered pairs (x, y) yields the following statistics:

b0 = 3.21

b1 = 2.46

x = 10.7

For the model Y = β0 + β1 + ∈, compute the test statistic for the existence of a linear relationship between X and Y using the following hypotheses:

H0 : β1 = 0

Ha : β1 ≠ 0

(A) 2.926

(B) 0.925

(C) 2.242

(D) It cannot be computed from the information given. C

Compute a 95% confidence interval for β1.

(A) (0.016, 4.904)

(B) (0.766, 5.654)

(C) (0.046, 4.874)

(D) It cannot be computed from the information given A

Which of the following statements is always true?

(A) The chi-square distribution is skewed to the left.

(B) The chi-square distribution is never negative.

(C) The chi-square distribution is symmetric about its mean.

(D) The chi-square distribution can assume values from −∞ to +∞ B

Use of the chi-square statistics requires that each of the expected cell counts is

(A) at least 10

(B) no more than 10

(C) at least 5

(D) no more than 5 C

In a chi-square test of independence, the test statistic based on a contingency table with 5 rows and 4 columns has how many degrees of freedom?

(A) 9

(B) 15

(C) 12

(D) 7 C

What is the probability that a chi-square random variable with

20 degrees of freedom will exceed 34.170? Use the χ2 distribution table in Appendix D.

(A) 0.100

(B) 0.050

(C) 0.025

(D) 0.010 C

The following 3 3 × contingency table shows the results of classifying

200 students from a random sample of students (50 freshmen, 60 sophomores, 50 juniors, and 40 seniors) from three regional universities according to mathematics anxiety level (low, moderate, and high). If the null hypothesis of no association between level of mathematics anxiety and university classification is true, what is the expected number of seniors who have high mathematics anxiety?

Anxiety Level

Classification Low Moderate High Total

Freshmen 15 20 15 50

Sophomores 15 15 30 60

Juniors 20 15 15 50

Seniors 10 10 20 40

Total 60 60 80 200

(A) 24

(B) 20

(C) 8

(D) 16 D

In a chi-square goodness-of-fit test, the null hypothesis is

H0: p1=p2=p3=p4. The test statistic computed from a sample size of

300 has how many degrees of freedom?

(A) 3

(B) 4

(C) 298

(D) 299 A

The following 2 2 × contingency table resulted from a study investigating sleeping habits and job performance at a small factory. One hundred workers were cross-classified according to sleeping habits (poor, good) and job performance (unsatisfactory, satisfactory). If the null hypothesis of no association between sleeping habits and job performance is true, what is the computed chi-square test statistic? (Round your answer, as needed.)

Job Performance

Sleeping Habits Unsatisfactory Satisfactory Total

Poor 20 10 30

Good 20 50 70

Total 40 60 100

(A) 12.698

(B) 11.175

(C) 14.080

(D) 6.857 A

Which of the following statements is NOT a required assumption for conducting a one-way ANOVA comparing k population means?

(A) The k populations under study have equal means.

(B) The k populations under study have equal variances.

(C) The k populations under study are normally distributed.

(D) Independent random sampling is used to select the samples from the k populations A

In a two-way ANOVA, the significance of which effect should be examined first?

(A) The significance of the effect of factor 1.

(B) The significance of the effect of factor 2.

(C) The significance of the interaction effect between factors 1 and 2.

(D) It does not matter which effect's significance is examined first. C

In an ANOVA, which of the following measures is used to find the variability of the observed values of the response variable around their respective treatment means?

(A) SSE

(B) MSE

(C) SStreatment

(D) SStotal C

In a one-way ANOVA comparing 4 treatments with 5 observations per treatment, what is the cutoff point for the rejection region associated with the test of hypothesis of equal means? Use the F-distribution table in Appendix E.

(A) 5.8025

(B) 3.2389

(C) 8.6923

(D) 3.2874 B

In a one-way ANOVA comparing 4 treatments with 5 observations per treatment, SStreatment = 763.75, and SSE = 1,210. Compute the F-test statistic, and indicate whether it is significant (\*) or not significant (N.S.). (Round your answer to 3 decimal places.)

(A) 3.366 N.S.

(B) 3.366\*

(C) 0.631 N.S.

(D) 0.631\* B

A retail store executive wants to know whether the store's average

Internet sales exceed its average mail-order sales. A random sample of 15 Internet sales yielded a mean sale amount of $86.40 with a standard deviation of $18.75. A random sample of 10 mail-order sales yielded a mean sale amount of $75.20 with a standard deviation of $14.25. Assume that the population variances are equal and that the two populations from which the samples are drawn are normally distributed. To determine whether the true mean Internet sale exceeds the true mean mail-order sale, which inferential statistical test is most appropriate?

(A) two-sample independent t-test

(B) paired t-test

(C) two-sample proportion z-test

(D) none of the above A

A researcher conducted a study to determine the effectiveness of a reading intervention. The pre-and post-assessment data for 8 students are shown in the following table. Assume the population of differences is normally distributed. To determine whether the intervention produces higher post assessment scores, which inferential statistical test is most appropriate?

Student ID Number 1 2 3 4 5 6 7 8

Pre-assessment score 44 55 25 54 63 38 31 34

Post-assessment score 55 68 40 55 75 52 49 48

(A) two-sample independent t-test

(B) paired t-test

(C) two-sample proportion z-test

(D) none of the above B

A researcher conducts a study to determine whether there is a significant age difference in married couples. Data collected by the researcher from six married couples are shown in the following chart. To test the null hypothesis that the true mean difference between the ages of married couples is zero, which inferential statistical test is most appropriate? Couple ID Code A B C D E F

Husband's age (in years) 65 48 33 65 44 24

Wife's age (in years) 57 49 29 65 41 23

Difference (in years) 8 -1 4 0 3 1

(A) two-sample independent t-test

(B) paired t-test

(C) two-sample proportion z-test

(D) none of the above D

Interior designers maintain that blue is the favorite hue of most people. An interior designer believes that adults 25 to 39 years old are less likely to prefer blue than are adults 40 to 59 years old. In a random sample of 430 adults 25 to 39 years old, 292 chose blue as their favorite hue, and in a random sample of 245 adults 40 to 59 years old, 180 chose blue. Assuming the sample sizes are sufficiently large, which inferential statistical test is most appropriate for determining whether the sample data support the interior designer's belief?

(A) two-sample independent t-test

(B) paired t-test

(C) two-sample proportion z-test

(D) none of the above C

A consumer group conducts a study to compare the average miles per gallon (mpg) achieved in road tests of two popular car brands. A random sample of 5 cars from Brand 1 were tested, yielding x1 = 29.5 mpg and s1 = 7.4 mpg. A random sample of 8 cars from Brand 2 were tested, yielding x2 = 31.6 mpg and s2 = 8.4 mpg. Assume that the population variances are equal. To test the null hypothesis of no difference between m1, the true average miles per gallon for Brand 1, and m2, the true average miles per gallon for Brand 2, which inferential statistical test is most appropriate?

(A) two-sample independent t-test

(B) paired t-test

(C) two-sample proportion z-test

(D) none of the above D

An experiment was performed to determine whether people who go on a low-fat diet for a month lose weight. The data for the experiment are shown in the following table. Assume the population of differences is normally distributed. To determine whether these data provide evidence that the low-fat one-month diet is effective, which inferential statistical test is most appropriate?

Participant ID Code A B C D E F

Starting weight (in pounds) 165 148 210 154 198 145

Ending weight (in pounds) 159 149 195 150 187 142

Difference (in pounds) 6 -1 15 4 11 3

(A) two-sample independent t-test

(B) paired t-test

(C) two-sample proportion z-test

(D) none of the above B

A health organization asserts that the prevalence of smoking among male adults 18 years or older in the United States exceeds the prevalence of smoking among female adults 18 years or older. In a survey of 1,000 US adults 18 years or older, 129 of the 516 male respondents identified themselves as smokers, and 87 of the 484 female respondents identified themselves as smokers. Assume the sample sizes are sufficiently large. To test whether the data from the survey support the health organization's assertion, which inferential statistical test is most appropriate?

(A) two-sample independent t-test

(B) paired t-test

(C) two-sample proportion z-test

(D) none of the above C

Random samples of size n1 = 40 and n2 = 30 were drawn from populations 1 and 2, respectively. The samples yielded pˆ

1 = 0.1 and pˆ2 = 0.5. Before collecting the data, a pollster predicted no difference between p1 and p2. Which inferential statistical test is most appropriate for determining whether the data dispute the pollster's prediction?

(A) two-sample independent t-test

(B) paired t-test

(C) two-sample proportion z-test

(D) none of the above D

A consumer group wants to test the performance of two types of gasoline. Miles per gallon were calculated for 5 pairs of matched vehicles that were driven the same distance under the same conditions. In each pair, one vehicle used Gasoline 1, and the other vehicle used Gasoline 2. The data are displayed in the following table. Assume the population of differences is normally distributed. Which inferential statistical test is most appropriate for testing the hypothesis of no difference in the gasoline fuels?

Pair 1 Pair 2 Pair 3 Pair 4 Pair 5

Gasoline 1 33.0 24.7 37.6 21.4 35.9

Gasoline 2 35.2 28.1 35.0 23.5 32.5

Difference -2.2 -3.4 2.6 -2.1 3.4

(A) two-sample independent t-test

(B) paired t-test

(C) two-sample proportion z-test

(D) none of the above B

A retail store executive wants to know whether the store's average Internet sales exceed its average mail-order sales. A random sample of 15 Internet sales yielded a mean sale amount of $86.40 with a standard deviation of $18.75. A random sample of 10 mail-order sales yielded a mean sale amount of $75.20 with a standard deviation of $14.25. Assume the population variances are equal and the two populations from which the samples are drawn are normally distributed. To determine whether the sample data indicate that the true mean Internet sale amount exceeds the true mean mail-order sale amount, let µ1 be the true mean Internet sale amount and

µ2 be the true mean mail-order sale amount. State the null and alternative hypotheses for the hypothesis test.

(A) H0 µ1 ≥ µ2; Ha : µ1 < µ2

(B) H0 : µ1 < µ2 ; Ha : µ1 ≥ µ2

(C) H0 : µ1 ≤ µ2 ; Ha : µ1 > µ2

(D) H0 : µ1 > µ2; Ha : µ1 ≤ µ2 C

A researcher conducted a study to determine the effectiveness of a reading intervention. The pre- and post-assessment data for 8 students are shown in the following table. Assume the population of differences is normally distributed. To determine whether the intervention produces higher post assessment scores, let µ µ 1 2 − = µD, where µ1 is the true mean pre-assessment score and µ2 is the true mean post-assessment score. State the null and alternative hypotheses for the hypothesis test.

Student ID Number 1 2 3 4 5 6 7 8

Pre-assessment score 44 55 25 54 63 38 31 34

Post-assessment score 55 68 40 55 75 52 49 48

(A) H0 : µD ≤ 0; Ha : µD > 0

(B) H0 : µD < 0; Ha : µD ≥ 0

(C) H0 : µD > 0; Ha : µD ≤ 0

(D) H0 : µD ≥ 0; Ha : µD < 0 D

A consumer group conducts a study to compare the average miles per gallon (mpg) achieved in road tests of two popular car brands. A random sample of 5 cars from Brand 1 were tested, yielding x1 = 29.5 mpg and s1 = 7.4 mpg. A random sample of 8 cars from Brand 2 were tested, yielding x2 = 31.6 mpg and s2 = 8.4 mpg. Assume the population variances are equal and that two populations from which the samples are drawn are normally distributed. To test the null hypothesis of no difference between µ1, the true average miles

per gallon for Brand 1, and µ2, the true average miles per gallon for Brand 2, state the null and alternative hypotheses for the hypothesis test.

(A) H0 : µ1 ≠ µ2 ; Ha : µ1 = µ2

(B) H0 : µ1 = µ2; Ha : µ1 ≠ µ2

(C) H0: µD ≥ 0; Ha : µD < 0

(D) H0: µD ≤ 0; Ha : µD > 0 B

Interior designers maintain that blue is the favorite hue of most people. An interior designer believes that adults 25 to 39 years old are less likely to prefer blue than are adults 40 to 59 years old. In a random sample of 430 adults 25 to 39 years old, 292 chose blue as their favorite hue, and in a random sample of 245 adults 40 to 59 years old, 180 chose blue. To determine whether the sample data support the interior designer's belief, where p1 is the true proportion of adults 25 to 39 years old whose favorite hue is blue and p2 is the true proportion of adults 40 to 59 years old whose favorite hue is

blue, state the null and alternative hypotheses for the hypothesis test.

(A) H0 : p1 ≤ p2 ; Ha : p1 > p2

(B) H0 : p1 < p2 ; Ha : p1 ≥ p2

(C) H0 : p1 ≥ p2 ; Ha : p1 < p2

(D) H0 : p1 > p2 ; Ha : p1 ≤ p2 C

An experiment was performed to determine whether people who go on a low-fat diet for a month lose weight. The data for the participants in the experiment are shown in the following table. Assume the population of differences is normally distributed, and let µ1 - µ 2 = µD, where µ1 is the true mean starting weight and µ2 is the true mean ending weight. To determine whether the data provide evidence that the low-fat one-month diet is effective, state the null and alternative hypotheses for the hypothesis test.

Participant ID Code A B C D E F

Starting weight (in pounds) 165 148 210 154 198 145

Ending weight (in pounds) 159 149 195 150 187 142

Difference (in pounds) 6 -1 15 4 11 3

(A) H0 : µD ≤ 0; Ha : µD > 0

(B) H0 : µD < 0; Ha : µD < 0

(C) H0 : µD = 0; Ha : µD ≠ 0

(D) H0 : µD ≥ 0; Ha : µD > 0 A

A health organization asserts that the prevalence of smoking among male adults 18 years or older in the United States exceeds the prevalence of smoking among female adults 18 years or older. In a random survey of 1,000 US adults 18 years or older, 129 of the 516 male respondents identified themselves as smokers, and 87 of the 484 female respondents identified themselves as smokers. Let p1 be the true proportion of male adults 18 years or older in the United States who are smokers and p2 be the true proportion of female adults 18 years or older in the United States who are smokers. To determine whether the data from the survey support the health organization's assertion, state the null and alternative hypotheses for the hypothesis test.

(A) H0 : p1 ≤ p2 ; Ha : p1 < p2

(B) H0 : p1 ≤ p2; Ha : p1 > p2

(C) H0 : p1 = p2; Ha : p1 ≠ p2

(D) H0 : p1 ≤ p2; Ha : p1 ≥ p2 B

A consumer group wants to test the performance of two types of gasoline. Miles per gallon were calculated for 5 pairs of matched vehicles that were driven the same distance under the same conditions. In each pair, one vehicle used Gasoline 1, and the other vehicle used Gasoline 2. The data are displayed in the following table. Assume the population of differences is normally distributed, and let µ1 − µ2 = µD, where µ1 is the true mean miles per gallon for Gasoline 1 and µ2 is the true mean miles per gallon for Gasoline 2. To test the hypothesis of no difference in the types of gasoline, state the null and alternative hypotheses for the hypothesis test.

Pair 1 Pair 2 Pair 3 Pair 4 Pair 5

Gasoline 1 33.0 24.7 37.6 21.4 35.9

Gasoline 2 35.2 28.1 35.0 23.5 32.5

Difference -2.2 -3.4 2.6 -2.1 3.4

(A) H0 : µD = 0; Ha : µD ≠ 0

(B) H0 : µD ≥ 0; Ha : µD < 0

(C) H0 : µD < 0; Ha : µD > 0

(D) H0 : µD ≠ 0; Ha : µD = 0 A

A retail store executive wants to know whether the store's average Internet sales exceed its average mail-order sales. A random sample of 15 Internet sales yielded a mean sale amount of $86.40 with a standard deviation of $18.75. A random sample of 10 mail-order sales yielded a mean sale amount of $75.20 with a standard deviation of $14.25. Assume the population variances are equal and the two populations from which the samples are drawn are normally distributed. Let µ1 be the true mean Internet sale amount and µ2 be the true mean mail-order sale amount. To determine whether the sample data indicate that the true mean Internet sale amount

exceeds the true mean mail-order sale amount, compute T.S.

(A) −1.536

(B) 1.536

(C) −1.601

(D) 1.601 D

A researcher conducted a study to determine the effectiveness of a reading intervention. The pre-and post-assessment data for 8 students are shown in the following table. Assume the population of differences is normally distributed, and let µ1 −µ2 = µD, where µ1 is the true mean pre-assessment score and µ2 is the true mean post-assessment score. To determine whether the intervention produces higher post-assessment scores, compute T.S.

Student ID Number 1 2 3 4 5 6 7 8

Pre-assessment score 44 55 25 54 63 38 31 34

Post-assessment score 55 68 40 55 75 52 49 48

(A) −6.920

(B) 6.473

(C) −6.473

(D) 6.920 A

Interior designers maintain that blue is the favorite hue of most people. An interior designer believes that adults 25 to 39 years old are less likely to prefer blue than are adults 40 to 59 years old. In a random sample of 430 adults 25 to 39 years old, 292 chose blue as their favorite hue, and in a random sample of 245 adults 40 to 59 years old, 180 chose blue. Let p1 be the true proportion of adults 25 to 39 years old whose favorite hue is blue and p2 be the true proportion of adults 40 to 59 years old whose favorite hue is blue. To determine whether the survey data support the interior designer's belief, compute T.S.

(A) 1.515

(B) 1.555

(C) −1.515

(D) −1.555 C

A consumer group conducts a study to compare the average miles per gallon (mpg) achieved in road tests of two popular car brands. A random sample of 5 cars from Brand 1 were tested, yielding x1 = 29.5 mpg and s 1 = 7.4 mpg. A random sample of 8 cars from Brand 2 were tested, yielding x2 = 31.6 mpg and s2 = 8.4 mpg. Assume the population variances are equal and the two populations from which the samples are drawn are normally distributed. To test the null hypothesis of no difference in average miles per gallon between the two car brands, compute the p-value and indicate its significance. (at the a = 0.05 level.)

(A) 0.6562\*

(B) 0.6562 N.S.

(C) 0.6474\*

(D) 0.6474 N.S. B

An experiment was performed to determine whether people who go on a low-fat diet for a month lose weight. The data for the participants in the experiment are shown in the following table. Assume the population of differences is normally distributed, and let µ1 − µ2 = µD, where µ1 is the true mean before weight and µ2 is the true mean after weight. To test whether these data provide evidence that the low-fat one-month diet is effective, compute the p-value and indicate its significance.

Participant ID Code A B C D E F

Starting weight (in pounds) 165 148 210 154 198 145

Ending weight (in pounds) 159 149 195 150 187 142

Difference (in pounds) 6 -1 15 4 11 3

(A) 0.0129 N.S.

(B) 0.0437 N.S.

(C) 0.0437\*

(D) 0.0219 D

A health organization asserts that the prevalence of smoking among male adults 18 years or older in the United States exceeds the prevalence of smoking among female adults 18 years or older. In a random survey of 1,000 US adults 18 years or older, 129 of the 516 male respondents identified themselves as smokers, and 87 of the 484 female respondents identified themselves as smokers. Let p1 be the true proportion of male adults 18 years or older in the United States who are smokers and p2 be the true proportion of female adults 18 years or older in the United States who are smokers. To test whether the data from the survey support the health organization's assertion, compute the p-value for the appropriate hypotheses and indicate its significance.

(A) 2.697\*

(B) 2.697 N.S.

(C) 0.0035\*

(D) 0.0035 N.S. C

A consumer group wants to test the performance of two types of gasoline. Miles per gallon were calculated for 5 pairs of matched vehicles that were driven the same distance under the same conditions. In each pair, one vehicle used Gasoline 1, and the other vehicle used Gasoline 2. The data are displayed in the following table. Assume the population of differences is normally distributed. To test the hypothesis of no difference in the gasoline fuels, compute the p-value and indicate its significance.

Pair 1 Pair 2 Pair 3 Pair 4 Pair 5

Gasoline 1 33.0 24.7 37.6 21.4 35.9

Gasoline 2 35.2 28.1 35.0 23.5 32.5

Difference -2.2 -3.4 2.6 -2.1 3.4

(A) 0.8186\*

(B) 0.8186 N.S.

(C) 0.5907\*

(D) 0.5907 N.S B

Which one of the following statements is always true?

(A) A one-sample test of hypothesis has two competing hypotheses

about a population statistic.

(B) In a test of hypothesis, only the alternative hypothesis is actually

tested.

(C) In formulating hypotheses, no information from the sample is

used in the hypotheses statements.

(D) A helpful guideline for formulating hypotheses is that the null

hypothesis always contains an inequality C

Which one of the following statements is always true?

(A) If H0 contains ≠, the hypothesis test is two-tailed.

(B) If Ha contains >, the hypothesis test is left-tailed.

(C) If Ha contains ≠, the hypothesis test is two-tailed.

(D) If H0 contains ≤, the hypothesis test is left-tailed. C

Which one of the following statements is always true?

(A) If a test of hypothesis is significant at the 5% significance level,

then the test would also be significant at the 1% significance level.

(B) If a test of hypothesis is significant at the 1% significance level,

then the test would also be significant at the 5% significance level.

(C) If a test of hypothesis is significant at the 10% significance level,

then the test would also be significant at the 1% significance level.

(D) If a test of hypothesis is significant at the 10% significance level,

then the test would also be significant at the 5% significance level. B

Which one of the following statements is always true?

(A) The greater the p-value of a hypothesis test, the stronger is the belief in the null hypothesis.

(B) If the p-value of a hypothesis test is less than α, its significance level, the null hypothesis should be rejected.

(C) The p-value of a hypothesis test is the probability that the null hypothesis is true.

(D) The significance level is the probability of rejecting a false null hypothesis. B

A manufacturer of car batteries claims the average life of its batteries is at least 45 months. A random sample of 80 car batteries from the manufacturer yielded x-BAR = 39 months and s = 8 months. A consumer group wants to determine whether the sample data dispute the manufacturer's claim. Assuming the population is normally distributed σ, which inferential statistical test is most appropriate for this situation?

(A) one-sample t-test

(B) one-sample z-test

(C) one-sample proportion z-test

(D) none of the above A

The fund-raising officer for a charity organization claims the average donation from contributors to the charity is $250.00. To test the claim, a random sample of 100 donations is obtained, yielding x-BAR = $234.85 and s = $98.35. Assume σ = $95.23. Which inferential statistical test is most appropriate for this situation?

(A) one-sample t-test

(B) one-sample z-test

(C) one-sample proportion z-test

(D) none of the above B

A local deli chain advertises that its "heart-healthy" sandwich contains a mere 10 fat grams. To test the deli chain's claim, a nutritionist selected a random sample of 4 heart-healthy sandwiches. The sample yielded x = 11 grams and s = 1.8 grams. Assuming σ is unknown, which inferential statistical test is most appropriate for this situation?

(A) one-sample t-test

(B) one-sample z-test

(C) one-sample proportion z-test

(D) none of the above D

In a sample for a government study of 80 working women in a metropolitan area, 30 were over the age of 60. Government officials want to know whether the sample data dispute an earlier claim that the true proportion of working women over the age of 60 in the metropolitan area is no more than 0.18. Which inferential statistical test is most appropriate for this situation?

(A) one-sample t-test

(B) one-sample z-test

(C) one-sample proportion z-test

(D) none of the above C

A real estate broker's newsletter says the average price of a house in a metropolitan area is $300,000. A random sample of 50 house prices in the metropolitan area yielded x = $320,000. Assume σ = $47,000. You want to know whether the sample data cast doubt on the average given in the broker's newsletter. Which inferential statistical test is most appropriate?

(A) one-sample t-test

(B) one-sample z-test

(C) one-sample proportion z-test

(D) none of the above B

A professor of interior design conjectures that the proportion of assisted living residents who would prefer blue for their bedroom walls is greater than 0.75. In a random sample of 300 assisted-living residents, 240 said they preferred blue on bedroom walls. The professor wants to determine whether the sample data support the conjecture. Which inferential statistical test is most appropriate?

(A) one-sample t-test

(B) one-sample z-test

(C) one-sample proportion z-test

(D) none of the above C

The weights of newborn baby girls born at a county hospital are normally distributed. A hospital administrator conducts a study to determine whether the mean weight of all newborn baby girls born at the hospital is Less than 100 ounces. A random sample of size n = 20 had a mean weight of 95 ounces and a standard deviation of 7 ounces. Assume σ is unknown. To determine whether, at the 1% significance level, the data indicate that the mean weight of all newborn baby girls born at the county hospital is less than 100 ounces, which inferential statistical test is most appropriate?

(A) one-sample t-test

(B) one-sample z-test

(C) one-sample proportion z-test

(D) none of the above A

A random check of 500 lightning cables manufactured by a company

found 15 were defective. Quality-control guidelines established by the manufacturer require that the proportion of its lightning cables that are defective must be less than 0.05. The manufacturer wants to determine whether it is meeting its quality control guidelines. Which inferential statistical test is most appropriate for this situation?

(A) one-sample t-test

(B) one-sample z-test

(C) one-sample proportion z-test

(D) none of the above C

The average caloric intake of 500 randomly selected adults in the United States was 2,400 calories per day. The researchers want to test a prior claim that the true mean caloric intake of all adults in the United States is no more than 2,300 calories per day. Assume a population standard deviation of 930 calories. Which inferential statistical test is most appropriate for this situation?

(A) one-sample t-test

(B) one-sample z-test

(C) one-sample proportion z-test

(D) none of the above B

The advertising manager for a radio station wants to test the hypothesis that the percent of radio listeners in the area who listen to the manager's radio station is at least 40%. In a random sample of 100 radio listeners in the area, 34 said they listen to the manager's station. Which inferential statistical test is most appropriate for testing the manager's hypothesis?

(A) one-sample t-test

(B) one-sample z-test

(C) one-sample proportion z-test

(D) none of the above C

In a random sample of 100 remote controls manufactured by a company, 2 were found to be defective. The manufacturer's quality-control guidelines require that the percent of all its remote controls that are defective must be less than 3%. The manufacturer wants to determine whether it is meeting its quality control guidelines. Which inferential statistical test is most appropriate for this situation?

(A) one-sample t-test

(B) one-sample z-test

(C) one-sample proportion z-test

(D) none of the above D

The fund-raising officer for a charity organization claims the average donation from contributors to the charity is $250.00. To test the claim, a random sample of 100 donations is obtained, yielding x-BAR = $234.85 and s = $98.35. Assume σ = $95.23. State the null and alternative hypotheses for the appropriate hypothesis test.

(A) H0 : μ = 250.00; Hα : α≠ 250.00

(B) H0 : μ ≠ 250.00; Hα : μ = 250.00

(C) H0 : μ = $234.85; Hα : μ ≠ $234.85

(D) H0 : μ ≠ $234.85; Hα : μ = $234.85 A

A manufacturer of car batteries claims the average life of its batteries is at least 45 months. A random sample of 80 car batteries from the manufacturer yielded x-BAR = 39 months and s = 8 months. A consumer group wants to determine whether the sample data dispute the manufacturer's claim. Assuming the population is normally distributed and s is unknown, state the null and alternative hypotheses for the appropriate hypothesis test.

(A) H0 : μ ≥ 39; Hα : μ < 39

(B) H0 : μ ≥ 45; Hα : μ < 45

(C) H0 : m < 39; Hα : μ ≥ 39

(D) H0 : μ < 45; Hα : μ ≥ 45 B

The average caloric intake of 500 randomly selected adults in the United States was 2,400 calories per day. The researchers want to test an earlier claim that the true mean caloric intake of all adults in the United States is no more than 2,300 calories per day. Assume a population standard deviation of 930 calories. State the null and alternative hypotheses for the appropriate hypothesis test.

(A) H0 : m ≤ 2,400; Ha : m > 2,400

(B) H0 : m > 2,400; Ha : m ≤ 2,400

(C) H0 : m ≤ 2,300; Ha : m > 2,300

(D) H0 : m > 2,300; Ha : m ≤ 2,300 C

A local deli chain advertises that its "heart-healthy" sandwich has a mere 10 fat grams. Suppose that the amount of fat grams in a heart-healthy sandwich is a normal random variable and s is unknown. To test the deli chain's claim, a nutritionist selected a random sample of 4 heart-healthy sandwiches. The sample yielded x-BAR = 11 grams and s = 1.8 grams. State the null and alternative hypotheses for the appropriate hypothesis test.

(A) H0 : m = 11; Ha : m < 11

(B) H0 : m = 11; Ha : m ≠ 11

(C) H0 : m = 10; Ha : m < 10

(D) H0 : m = 10; Ha : m ≠ 10 D

A real estate broker's newsletter says the average price of a house in a metropolitan area is $300,000. A random sample of 50 house prices in the metropolitan area yielded x -bar= $320,000. Assuming σ = $47,000, you want to know whether the sample data cast doubt on the listing in the broker's newsletter. States the null and alternative hypotheses for the appropriate hypothesis test.

(A) H0 : m = 300,000; Ha : m ≠ 300,000

(B) H0 : m = 320,000; Ha : m ≠ 300,000

(C) H0 : m = 300,000; Ha : m > 300,000

(D) H0 : m = 320,000; Ha : m > 300,000 A

The weights of newborn baby girls born at a county hospital are normally distributed. A hospital administrator conducts a study to determine whether the mean weight of all newborn baby girls born at the hospital is less than 100 ounces. A random sample of size n = 20 had a mean weight of 95 ounces and a standard deviation of 7 ounces. Assume σ is unknown. The administrator's research question is whether, at the 1% significance level, these data indicate that the mean weight of all newborn baby girls born at the county hospital is less than 100 ounces. State the null and alternative hypotheses for the appropriate hypothesis test.

(A) H0 : m ≤ 100; Ha : m < 100

(B) H0 : m ≥ 100; Ha : m < 100

(C) H0 : m ≥ 95; Ha : m < 95

(D) H0 : m ≤ 95; Ha : m > 95 B

A random check of 500 lightning cables manufactured by a company found 15 were defective. The manufacturer's quality-control guidelines require that the proportion of its lightning cables that are defective must be less than 0.05. The manufacturer wants to determine whether it is meeting its quality control guidelines. State the null and alternative hypotheses for the appropriate hypothesis test.

(A) H0 : p ≥ 15; Ha : p < 15

(B) H0 : p = 15; Ha : p ≠ 15

(C) H0 : p ≥ 0.05; Ha : p < 0.05

(D) H0 : p = 0.05; Ha : p ≠ 0.05 C

In a sample for a government study of 80 working women in a metropolitan area, 30 were over the age of 60. Government officials want to know whether the sample data dispute an earlier claim that the true proportion of working women over the age of 60 in the metropolitan area is no more than 0.18. State the null and alternative hypotheses for the appropriate hypothesis test.

(A) H0 : p = 80; Ha : p > 80

(B) H0 : p ≤ 80; Ha : p > 80

(C) H0 : p ≤ 0.18; Ha : p > 0.18

(D) H0 : p > 0.18; Ha : p ≤ 0.18 A

The advertising manager for a radio station wants to test the hypothesis that the percent of radio listeners in the area who listen to the manager's radio station is at least 40%. In a random sample of 100 radio listeners in the area, 34 said they listen to the manager's station. State the null and alternative hypotheses for the appropriate hypothesis test.

(A) H0 : p ≥ 0.40; Ha : p < 0.40

(B) H0 : p = 0.40; Ha : p = 0.60

(C) H0 : p ≥ 0.34; Ha : p < 0.34

(D) H0 : p = 0.34; Ha : p = 0.66 C

A professor of interior design conjectures that the proportion of assisted living residents who prefer blue for their bedroom walls is greater than 0.75. In a random sample of 300 assisted-living residents, 240 said they prefer blue on bedroom walls. The professor wants to determine whether the sample data support the conjecture. State the null and alternative hypotheses for the appropriate hypothesis test.

(A) H0 : p > 0.75; Ha : p < 0.75

(B) H0 : p ≥ 0.75; Ha : p < 0.75

(C) H0 : p ≤ 0.75; Ha : p > 0.75

(D) H0 : p < 0.75; Ha : p > 0.75 C

Suppose that, unknown to a researcher, the reality of the following

hypotheses is as shown. The researcher decides to accept H0. Which of the following statements is true about the decision?

H0 : µ ≥15 False

Ha : µ < 15 True

(A) The researcher made the correct decision to accept H0.

(B) The researcher made the correct decision to reject Ha.

(C) The researcher made a type I error.

(D) The researcher made a type II error. D

Suppose that, unknown to a researcher, the reality of the following

hypotheses is as shown. The researcher decides to reject H0 and accept Ha. Which of the following statements is true about the decision?

H0 : µ ≤ 500 False

Ha : µ > 500 True

(A) The researcher made the correct decision to accept Ha.

(B) The researcher made the wrong decision to reject H0.

(C) The researcher made a type I error.

(D) The researcher made a type II error. A

Suppose that, unknown to a researcher, the reality of the following

hypotheses is as shown. The researcher decides to reject H0 and accept Ha. Which of the following statements is true about the decision?

H0 : p = 0.60 True

Ha : p ≠ 0.60 False

(A) The researcher made the correct decision to accept Ha.

(B) The researcher made the correct decision to reject H0.

(C) The researcher made a type I error.

(D) The researcher made a type II error. C

Which one of the following statements is always true?

(A) The probability of making a type II error is less than the probability

of making a type I error.

(B) The probability of making a type I error and the probability of making a type II error are inversely related for a fixed sample size.

(C) For a given sample size, as the probability of making a type I error

increases, the probability of making a type II error increases as well.

(D) Researchers customarily set the risk of a type I error at 0.95. B

The hypotheses for a hypothesis test concerning µ from a normally distributed population are as shown:

H0 : µ ≥15

Ha : m < 15

Suppose n = 20, and s is known. At the 5% significance level, H0 will be rejected if and only if the test statistic is

(A) less than −1.645

(B) less than −1.645 or greater than 1.645

(C) less than −1.729

(D) less than −1.729 or greater than 1.729 A

The hypotheses for a hypothesis test concerning p are as follows:

H0 : p = .8

Ha : p ≠ .8

Suppose n = 400. At the 5% significance level, H0 will be rejected if and only if the test statistic is

(A) less than −1.645

(B) less than −1.645 or greater than 1.645

(C) less than −1.96

(D) less than −1.96 or greater than 1.96 D

The hypotheses for a hypothesis test concerning m are as follows:

H0 : m ≤ 12

Ha : m > 12

Suppose n = 35, and s is unknown. At the 5% significance level, H0 will be rejected if and only if the test statistic is

(A) greater than 1.645

(B) less than −1.645 or greater than 1.645

(C) greater than 1.691

(D) less than −1.691 or greater than 1.691 C

To test a claim that the mean of a certain population is 22 at the 5%

significance level, a random sample of size n = 50 was obtained from the population. The sample yielded x = 25. Assume the standard deviation σ = 8. Compute T.S.

(A) 2.652

(B) 0.375

(C) −0.375

(D) −2.652 A

A random sample of size n = 40 obtained from a normally distributed population with unknown s yielded x = 26.7 and standard deviation s = 6. The researcher wants to know whether the data cast doubt on a conjecture that the population mean is at least 28. Compute T.S.

(A) −0.217

(B) −1.370

(C) 1.370

(D) 0.217 B

To test a claim that the mean of a certain population is greater than 300, researchers obtain a random sample of size n = 100 from the population, yielding x = 301 and s = 37. The researchers want to determine at the 5% significance level whether these data support the claim. Compute T.S.

(A) −0.270

(B) −0.027

(C) 0.270

(D) 0.027 C

A random sample of size n = 36 obtained from a population with standard deviation σ = 15 yielded x = 58 and s = 14. Before obtaining the sample, the researcher had conjectured that the mean was no more than 50. A test of hypothesis is performed at the 1% significance level to test the conjecture. Compute T.S.

(A) −3.429

(B) 3.429

(C) −3.200

(D) 3.200 D

To investigate a claim that the mean of a population exceeds 120, a random sample of size n = 225 was obtained from the population, yielding x = 123. Assume σ = 25. The research team wants to know whether the sample data support the claim at the 5% significance level. Compute T.S.

(A) 1.800

(B) 0.120

(C) −1.800

(D) −0.120 A

The fund-raising officer for a charity organization claims the average donation from contributors to the charity is $250.00. To test the claim, a random sample of 100 donations is obtained, yielding x = $234.85 and s =$98.35. Assume σ = $95.23. Compute T.S.

(A) −1.540

(B) −1.591

(C) 1.591

(D) 1.540 B

A manufacturer of car batteries claims the average life of its batteries is at least 45 months. A random sample of 80 car batteries from the manufacturer yielded x = 39 months, and s = 8 months. A consumer group wants to determine whether the sample data dispute the manufacturer's claim. Assuming the population is normally distributed and s is unknown, compute T.S.

(A) 6.708

(B) 9.910

(C) −6.708

(D) −9.910 C

The average caloric intake of 500 randomly selected adults in the United States was 2,400 calories per day. The researchers want to test a prior claim that the true mean caloric intake of all adults in the United States is no more than 2,300 calories per day. Assume a population standard deviation of 930 calories. Compute T.S.

(A) −0.008

(B) −2.404

(C) 0.008

(D) 2.404 D

A real estate broker's newsletter says the average price of a house in a metropolitan area is $300,000. A random sample of 50 house prices in the metropolitan area yielded x = $320,000. Assume s = $47,000. To test whether, at the 1% significance level, these data cast doubt on the average in the broker's newsletter, compute T.S.

(A) 3.009

(B) −3.009

(C) 0.003

(D) −0.003 A

The weights of newborn baby girls born at a county hospital are normally distributed. A hospital administrator conducts a study to determine whether the mean weight of all newborn baby girls born at the hospital is less than 100 ounces. A random sample of size n = 20 had a mean weight of 95 ounces and a standard deviation of 7 ounces. Assume s is unknown. To determine whether, at the 1% significance level, these data indicate that the mean weight of all newborn baby girls born at the county hospital is less than 100 ounces, compute T.S.

(A) 0.002

(B) −3.194

(C) −0.002

(D) 3.194 B

At the 5% significance level, for which one of the following p-values will H0 be rejected?

(A) p-value = 0.3498

(B) p-value = 0.0499

(C) p-value = 0.0501

(D) p-value = 0.2000 B

A claim is made that the mean of a certain population is 22. To test the claim at the 5% significance level, a random sample of size n = 50 was obtained from the population, yielding x = 25. Assume the standard deviation σ = 8. Find the p-value for the test of the hypothesis.

(A) 0.0040

(B) 0.0250

(C) 0.0080

(D) 0.9960 C

A random sample of size n = 40 obtained from a normally distributed population with unknown σ yielded x = 26.7 and standard deviation

s = 6. The researcher wants to know, at the 1% significance level, whether the data cast doubt on a conjecture that the population mean is at least 28. Find the p-value for the test of hypothesis.

(A) 0.9108

(B) 0.1784

(C) 0.0100

(D) 0.0892 D

A claim is made that the mean of a certain population is 22. To test the claim at the 5% significance level, a random sample of size n = 50 was obtained from the population, yielding x = 25. Assume the standard deviation σ = 8. State the conclusion for the test of hypothesis.

(A) At the 5% significance level, the data provide sufficient evidence to

indicate that the mean of the population is not 22.

(B) At the 5% significance level, the data provide sufficient evidence to

indicate that the mean of the population is 22.

(C) At the 5% significance level, the data do not provide sufficient evidence to indicate that the mean of the population is not 22.

(D) At the 5% significance level, the data do not provide sufficient evidence to indicate that the mean of the population is 25. A

A random sample of size n = 40 obtained from a normally distributed

population with unknown σ yielded x = 26.7 and standard deviation s =6. The researcher wants to know, at the 1% significance level, whether the data cast doubt on a conjecture that the population mean is at least 28. State the conclusion for the test of hypothesis.

(A) At the 1% significance level, the hypothesis that the mean of the

population is less than or equal to 28 is supported by the data.

(B) At the 1% significance level, the hypothesis that the mean of the

population is greater than 28 is not supported by the data.

(C) At the 1% significance level, the hypothesis that the mean of the

population is less than 28 is not supported by the data.

(D) At the 1% significance level, the hypothesis that the mean of the

population is less than 28 is supported by the data. C

A claim is made that the mean of a certain normally distributed population is 60. To test the claim, a research team obtained a random sample of size n = 16 from the population. The sample yielded x = 50 and a standard deviation s = 4. Assume σ is unknown. State the decision rule at the 5% significance level.

(A) Reject H0 if either T.S. < −1.96 or T.S. > 1.96.

(B) Reject H0 if either T.S. < −2.131 or T.S. > 2.131.

(C) Reject H0 if either T.S. < −1.753 or T.S. > 1.753.

(D) It cannot be determined from the information given B

A random sample of size n = 25 obtained from a normally distributed

population with unknown mean m and known σ = 5 yielded x = 26.7

and standard deviation s = 6.5. Before obtaining the sample, the researcher conjectured that the population mean was at least 28. State the decision rule at the 5% significance level.

(A) Reject H0 if T.S. < −1.645.

(B) Reject H0 if T.S. < −1.96.

(C) Reject H0 if T.S. < −1.711.

(D) It cannot be determined from the information give A

A claim is made that the mean of a certain normally distributed population is greater than 300. A random sample of size n = 15 obtained from the population yielded x = 301 and s = 37. Assume s is unknown. For determining whether the sample data support the claim, state the decision rule at the 10% significance level.

(A) Reject H0 if T.S. > 1.345.

(B) Reject H0 if T.S. > 1.761.

(C) Reject H0 if T.S. > 1.282.

(D) It cannot be determined from the information given A

A random sample of size n = 36 obtained from a population with standard deviation σ = 15 yielded x = 58 and s = 14. Before obtaining the sample, the researcher conjectured that the population mean was no more than 50. To test the conjecture, the researcher performed a test of hypothesis at the 1% significance level. State the decision rule.

(A) Reject H0 if T.S. > 2.576.

(B) Reject H0 if T.S. < −2.576 or T.S. > 2.576.

(C) Reject H0 if T.S. > 2.326.

(D) It cannot be determined from the information given. C

A claim is made that the mean of a normally distributed population exceeds 120. A random sample of size n = 20 obtained from the population yielded x = 123 and s = 25. Assume σ is unknown. For a hypothesis test of whether the sample data support the claim, state the decision rule at the 5% significance level.

(A) Reject H0 if T.S. > 1.729.

(B) Reject H0 if T.S. > 2.093.

(C) Reject H0 if T.S. > 1.325.

(D) It cannot be determined from the information given A

Suppose that scores on a standardized exam are normally distributed with σ = 100. The test company that administers the exam claims that the average score on the exam for all test takers is 500. To test the claim, a researcher obtained a random sample of 25 scores. The sample yielded x = 480 and s = 95.9. State the decision rule at the 5% significance level.

(A) Reject H0 if either T.S. < −2.064 or T.S. > 2.064.

(B) Reject H0 if either T.S. < −1.96 or T.S. > 1.96.

(C) Reject H0 if T.S. > 1.645.

(D) It cannot be determined from the information given B

A local deli chain advertises that its "heart-healthy" sandwich contains a mere 10 fat grams. To test the claim, a nutritionist selected a random sample of 4 heart-healthy sandwiches. The sample yielded x = 11 grams and s = 1.8 grams. State the decision rule at the 5% significance level for the appropriate hypothesis test.

(A) Reject H0 if either T.S. < −1.96 or T.S. > 1.96.

(B) Reject H0 if either T.S. < −2.353 or T.S. > 2.353.

(C) Reject H0 if either T.S. < −3.182 or T.S. > 3.182.

(D) It cannot be determined from the information given. D

A plumbing company has found that the standard deviation for the average length of time, in minutes, for installing a bathtub is 30 minutes. The plumbing company advertises that a bathtub installation takes no more than 2 hours. The owner of the company hired a statistician to test the company's claim. The statistician randomly selected a sample of 40 bathtub installations. The sample yielded x = 150 minutes and s = 35 minutes. State the decision rule at the 10% significance level.

(A) Reject H0 if T.S. > 1.303.

(B) Reject H0 if T.S. > 1.282.

(C) Reject H0 if T.S. > 1.645.

(D) It cannot be determined from the information given. B

The weights of newborn baby girls born at a county hospital are normally distributed. A hospital administrator conducts a study to determine whether the mean weight of all newborn baby girls born at the hospital is less than 100 ounces. A random sample of size n = 20 had a mean weight of 95 ounces and a standard deviation of 7 ounces. Assume σ is unknown. To determine whether, at the 1% significance level, these data indicate that the mean weight

of all newborn baby girls born at the county hospital is less than 100 ounces, state the decision rule.

(A) Reject H0 if T.S. < −2.33.

(B) Reject H0 if T.S. < −2.539.

(C) Reject H0 if T.S. < −1.328.

(D) It cannot be determined from the information given B

A consumer group complains that the mean lifetime of a certain brand of incandescent light bulbs is no more than 500 hours. A random sample of 5 of these light bulbs had a mean lifetime of 520 hours and a standard deviation of 50 hours. State the decision rule, at the 10% significance level, for deciding whether the group's claim should be rejected.

(A) Reject H0 if T.S. < −1.533.

(B) Reject H0 if T.S. > 1.533.

(C) Reject H0 if T.S. > 3.747.

(D) It cannot be determined from the information given D

For which one of the following combinations is the stated sample size n large enough, for the given value of p0, to perform a one-sample proportion z-test?

(A) n = 500, p0 = 0.05

(B) n = 300, p0 = 0.01

(C) n = 10, p0 = 0.75

(D) n = 2,000, p0 = 0.998 A

For which one of the following combinations is the stated sample size n too small, for the given value of p0, to perform a one-sample proportion z-test?

(A) n = 80, p0 = 0.18

(B) n = 100, p0 = 0.4

(C) n = 10, p0 = 0.5

(D) n = 120, p0 = 0.96 D

A random check of 500 lightning cables manufactured by a company

found 15 were defective. The company's quality-control guidelines require that the proportion of its lightning cables that are defective must be less than 0.05. The manufacturer wants to determine whether it is meeting its quality-control guidelines. State the decision rule at the 1% significance level.

(A) Reject H0 if T.S. > 2.326.

(B) Reject H0 if T.S. > 1.645.

(C) Reject H0 if T.S. < −2.326.

(D) It cannot be determined from the information given. C

In a sample for a government study of 80 working women in a metropolitan area, 30 women are over the age of 60. Government officials want to know whether the sample data dispute an earlier claim that the true proportion of working women over the age of 60 in the metropolitan area is no more than 0.18. State the decision rule at the 5% significance level.

(A) Reject H0 if T.S. > 1.645.

(B) Reject H0 if T.S. < −1.645.

(C) Reject H0 if either T.S. < −1.96 or T.S. > 1.96.

(D) It cannot be determined from the information given A

Suppose a lobbyist claims that the percent of registered voters who prefer a proposed measure is 98%. A pollster plans to conduct a survey of 200 registered voters to test the lobbyist's claim. State the decision rule at the 5% significance level.

(A) Reject H0 if either T.S. < −2.326 or T.S. > 2.326.

(B) Reject H0 if either T.S. < −1.96 or T.S. > 1.96.

(C) Reject H0 if either T.S. < −1.645 or T.S. > 1.645.

(D) It cannot be determined from the information given D

The advertising manager for a radio station wants to test the hypothesis that the percent of radio listeners in the area who listen to the manager's radio station is at least 40%. In a random sample of 100 radio listeners in the area, 34 said they listen to the manager's station. State the decision rule at the 5% significance level.

(A) Reject H0 if T.S. < −1.645.

(B) Reject H0 if T.S. > 1.645.

(C) Reject H0 if T.S. < −1.96.

(D) It cannot be determined from the information given. A

A professor of interior design conjectures that the proportion of assisted living residents who prefer blue on their bedroom walls is greater than 0.75. In a random sample of 300 assisted-living residents, 240 said they prefer blue on bedroom walls. State the decision rule for whether these data support the conjecture at the 5% significance level.

(A) Reject H0 if T.S. > 1.96.

(B) Reject H0 if T.S. > 1.645.

(C) Reject H0 if T.S. < −1.96.

(D) It cannot be determined from the information given. B

A market researcher predicts that the percent of households in a particular rural area that have no vehicle is at least 10%. To test this prediction, the researcher's team conducts a random sample of 120 households, yielding 6 households with no vehicle. State the decision rule at the 10% significance level.

(A) Reject H0 if either T.S. < −1.282 or T.S. > 1.282.

(B) Reject H0 if T.S. > 1.282.

(C) Reject H0 if T.S. < −1.282.

(D) It cannot be determined from the information given C

A random check of 500 lightning cables manufactured by a company

found 15 were defective. The company's quality-control guidelines require that the proportion of lightning cables it manufactures that are defective must be less than 0.05. The manufacturer wants to determine whether it is meeting its quality-control guidelines. Compute T.S.

(A) 0.0918

(B) −0.0918

(C) 2.052

(D) −2.052 D

In a sample for a government study of 80 working women in a metropolitan area, 30 were over the age of 60. Government officials want to know whether the sample data dispute an earlier claim that the true proportion of working women over the age of 60 in the metropolitan area is no more than 0.18. Compute T.S.

(A) 4.540

(B) 0.195

(C) −0.195

(D) −4.540 A

The advertising manager at a radio station wants to test the hypothesis that the percent of radio listeners in the area who listen to the manager's radio station is at least 40%. In a random sample of 100 radio listeners in the area, 34 said they listen to the manager's station. Compute T.S.

(A) 1.225

(B) −1.225

(C) 0.110

(D) −0.110 B

A professor of interior design conjectures that the proportion of assisted living residents who prefer blue for their bedroom walls is greater than 0.75. In a random sample of 300 assisted-living residents, 240 said they prefer blue on bedroom walls. The professor wants to know whether these data support the conjecture. Compute T.S.

(A) 2.000

(B) 2.275

(C) −2.000

(D) −2.275 A

A market researcher predicts that at least 10% of households in a particularly rural area have no vehicle. To test the prediction, the researcher's team conducted a random sample of 120 households, yielding 6 households with no vehicle. Compute the appropriate T.S.

(A) 0.0339

(B) −0.0339

(C) 1.826

(D) −1.826 D

The advertising manager for a radio station wants to test the hypothesis that the percent of radio listeners in the area who listen to the manager's radio station is at least 40%. In a random sample of 100 radio listeners in the area, 34 said they listen to the manager's station. Compute the p-value, and indicate its significance.

(A) 0.2207 N.S.

(B) 0.1103 N.S.

(C) 0.2207\*

(D) 0.1103\* B

A professor of interior design conjectures that the proportion of assisted living residents who prefer blue for their bedroom walls is greater than 0.75. In a random sample of 300 assisted-living residents, 240 said they prefer blue on bedroom walls. The professor wants to know whether these data support the conjecture. Compute the p-value, and indicate its significance.

(A) 0.0455 N.S.

(B) 0.0455\*

(C) 0.0228 N.S.

(D) 0.0228\* D

A market researcher predicts that at least 10% of households in a particular rural area have no vehicle. To test the prediction, the researcher's team conducts a random sample of 120 households, yielding 6 households with no vehicle. Compute the p-value, and indicate its significance.

(A) 0.0679\*

(B) 0.0679 N.S.

(C) 0.0339\*

(D) 0.0339 N.S. C

A random sample of size n = 100 is obtained from a population with μ = 300 and σ = 50. Which of the following statements best describes the sampling distribution of x ¯ in terms of its shape, mean, and standard deviation?

A) The sampling distribution of x ¯ is approximately normal with mean equal to 300 and standard deviation equal to 5.

(B) The sampling distribution of x ¯ is approximately normal with mean equal to 300 and standard deviation equal to 50.

(C) The sampling distribution of x ¯ is approximately normal with mean equal to 30 and standard deviation equal to 5.

(D) The sampling distribution of x ¯ is approximately normal with mean equal to 3 and standard deviation equal to 0.5. A

A random sample of size n = 36 is obtained from a population with μ = 60 and σ = 15. Which of the following statements best describes the sampling distribution of x ¯ in terms of its shape, mean, and standard deviation?

(A) The sampling distribution of x ¯ is approximately normal with mean equal to 10 and standard deviation equal to 15.

(B) The sampling distribution of x ¯ is approximately normal with mean equal to 60 and standard deviation equal to 2.5.

(C) The sampling distribution of x ¯ is approximately normal with mean equal to 60 and standard deviation equal to 15.

(D) The sampling distribution of x ¯ is positively skewed with mean equal to 10 and standard deviation equal to 2.5. B

A random sample of size n = 9 is obtained from a normally distributed population with μ = 25 and σ = 6. Which of the following statements best describes the sampling distribution of x ¯ in terms of its shape, mean, and standard deviation?

(A) The sampling distribution of x ¯ is a skewed distribution with mean

equal to 25 and standard deviation equal to 6.

(B) The sampling distribution of x ¯ is a skewed distribution with mean

equal to 25 and standard deviation equal to 2.

(C) The sampling distribution of x ¯ has a normal distribution with mean

equal to 25 and standard deviation equal to 2.

(D) The sampling distribution of x ¯ has a normal distribution with mean

equal to 25 and standard deviation equal to 2/3 C

A random sample of size n = 100 is obtained from a population with

μ = 300 and σ = 50. What is the probability that the sample mean will fall between 299 and 301?

(A) 0.0160

(B) 0.9545

(C) 0.0019

(D) 0.1585 D

A random sample of size n = 36 is obtained from a population with μ = 60 and σ = 15. What is the probability that the sample mean will be at least 58?

(A) 0.7881

(B) 0.5530

(C) 0.4470

(D) 0.2119 A

A random sample of size n = 9 is obtained from a normally distributed

population with μ = 25 and σ = 6. What is the probability that the sample mean will exceed 26.7?

(A) 0.8023

(B) 0.1977

(C) 0.3885

(D) 0.6115 B

A random sample of size n = 36 is obtained from a population with μ = 30 and σ = 12. Find the probability that the sample mean will be no more than 26.08.

(A) 0.0250

(B) 0.9750

(C) 0.3720

(D) 0.6280 A

A random sample of size n = 225 is obtained from a population with

μ = 120 and σ = 30. Find the probability that the sample mean will lie

between 122 and 124.

(A) 0.2645

(B) 0.0049

(C) 0.1359

(D) 0.0265 C

A random sample of size n = 25 is obtained from a normally distributed population with μ = 120 and σ = 15. Find the probability that the sample mean will be no more than 126.

(A) 0.3446

(B) 0.9772

(C) 0.6554

(D) 0.0228 B

A random sample of size n = 100 is obtained from a population with

μ = 1,200 and σ = 250. Find the probability that the sample mean will

lie between 1,200 and 1,250.

(A) 0.4772

(B) 0.9772

(C) 0.0793

(D) 0.1585 A

IQ scores for adults are normally distributed with mean μ = 100 and standard deviation σ = 15. If a random sample of 16 adults is selected, find the probability that the average IQ score in the sample will be at least 92.5.

(A) 0.0228

(B) 0.9772

(C) 0.6915

(D) 0.3085 B

Suppose that scores on a national exam are normally distributed with mean μ = 500 and standard deviation σ = 100. If a random sample of 200 test takers is selected, find the probability the average score of the sample will be between 500 and 520.

(A) 0.1000

(B) 0.0793

(C) 0.4977

(D) 0.5023 C

A local deli chain makes a signature sandwich. Suppose the measures of fat grams in the signature sandwiches are normally distributed with mean μ = 16 grams and standard deviation σ = 1.5 grams. If a random sample of 4 signature sandwiches is selected, find the probability that the average amount of fat grams will be no more than 16.9.

(A) 0.1151

(B) 0.7257

(C) 0.2743

(D) 0.8849 D

Obtain the confidence interval

A random sample of size n = 50 obtained from a population with unknown mean yielded x ¯ = 25. Assume the standard deviation σ = 8.

Construct a 95% confidence interval for μ.

(A) (22.8, 27.2)

(B) (23.1, 26.9)

(C) (11.8, 38.1)

(D) (9.32, 40.7) A

Obtain the confidence interval

A random sample of size n = 9 obtained from a normally distributed population with unknown mean μ yielded x ¯ = 26.7. Assume the standard deviation σ = 6. Construct a 90% confidence interval for μ.

(A) (25.39, 28.01)

(B) (23.41, 29.99)

(C) (25.60, 27.80)

(D) (22.78, 30.62) B

Obtain the confidence interval

A random sample of size n = 100 obtained from a population with standard deviation σ = 37 and unknown mean μ yielded x ¯ = 301. Construct a 90% confidence interval for μ.

(A) (291.5, 310.5)

(B) (300.4, 301.6)

(C) (294.9, 307.1)

(D) (293.8, 308.2) C

Obtain the confidence interval

A random sample of size n = 36 obtained from a population with

unknown mean μ yielded x ¯ = 58 and σ = 14. Assume σ = 15. Construct a 99% confidence interval for μ.

(A) (52.0, 64.0)

(B) (53.9, 62.1)

(C) (57.3, 58.7)

(D) (51.6, 64.4) D

Obtain the confidence interval

A random sample of size n = 225 obtained from a population with

unknown mean μ yielded x ¯ = 123 and σ = 28. Assume σ = 25. Construct a 90% confidence interval for μ.

(A) (119.7, 126.3)

(B) (120.3, 125.7)

(C) (118.7, 127.3)

(D) (119.9, 126.1) B

Obtain the specified confidence interval

A researcher at a health science center wants to estimate the average

amount of fat grams in the signature sandwich of a local deli. A random sample of 40 signature sandwiches yielded x ¯ = 17 fat grams and σ = 2.9 fat grams. Assume σ = 2.5 fat grams. Construct a 95% confidence interval for the average amount of fat grams in the signature sandwich of the local deli.

(A) (15.8, 18.2)

(B) (16.1, 17.9)

(C) (16.2, 17.8)

(D) (16.4, 17.7) C

Obtain the specified confidence interval

The fund-raising officer for a charity organization wants to estimate the average donation from contributors to the charity. A random sample of 100 donations yielded x ¯= $234.85 and σ = $98.35. Assume σ = $95.23. Construct a 90% confidence interval for the average donation from all contributors to the charity.

(A) $215.57 to $254.13

(B) $216.19 to $253.51

(C) $218.67 to $251.03

(D) $219.19 to $250.51 D

Obtain the specified confidence interval

A manufacturer of car batteries needs to estimate the average life of its batteries. A random sample of 40 batteries had x ¯ = 39 months and σ =9 months. Assume σ = 8 months. Calculate a 95% confidence interval for the average life of the manufacturer's batteries.

(A) 37.3 to 40.8 months

(B) 36.4 to 41.6 months

(C) 36.5 to 41.5 months

(D) 36.2 to 41.8 months C

Obtain the specified confidence interval

In a study of 500 randomly selected adults in the United States, the average calorie consumption of participants was 2,400 calories per day. Assume a population standard deviation of 930 calories per day. Calculate a 95% confidence interval for the true mean caloric intake per day of all adults in The United States.

(A) 2,292.9 to 2,507.1 calories

(B) 2,318.5 to 2,481.5 calories

(C) 2,331.6 to 2,468.4 calories

(D) 2,396.4 to 2,403.6 calories B

Obtain the specified confidence interval

A real estate broker needs to know the average house price in a metropolitan area. A random sample of 50 house prices in the metropolitan area yielded x ¯ = $120,000. Assume σ = $47,000. Give an 80% confidence interval for the average house price in the metropolitan area.

(A) $106,972 to $133,028

(B) $106,643 to $133,357

(C) $111,482 to $128,518

(D) $111,365 to $128,635 C

Obtain the specified confidence interval by formula. Use the t-distribution table in Appendix C to find the t values.

Consider a random sample of 16 measurements obtained from a normally distributed population with x ¯ = 450 and σ = 60. Construct a 90% confidence interval.

(A) (423.7, 476.3)

(B) (429.9, 470.1)

(C) (430.8, 469.2)

(D) (447.3, 452.6) A

Obtain the specified confidence interval by formula. Use the t-distribution table in Appendix C to find the t values.

Consider a random sample of 9 measurements obtained from a normally distributed population with x ¯ = 450 and σ = 60. Construct a 90% confidence interval.

(A) (417.1, 482.9)

(B) (412.8, 487.2)

(C) (403.9, 496.1)

(D) (448.1, 451.9) B

Obtain the specified confidence interval by formula. Use the t-distribution table in Appendix C to find the t values.

Consider a random sample of 25 measurements obtained from a normally distributed population with x ¯ = 450 and σ = 60. Construct a 90% confidence interval.

(A) (425.2, 474.8)

(B) (430.2, 469.7)

(C) (429.5, 470.5)

(D) (444.6, 455.4) C

Obtain the specified confidence interval by formula. Use the t-distribution table in Appendix C to find the t values.

Consider a random sample of 4 measurements obtained from a normally distributed population with x ¯ = 450 and σ = 60. Construct a 95% confidence interval.

(A) (354.5, 545.5)

(B) (391.2, 508.8)

(C) (379.4, 520.6)

(D) (449.0, 451.0) A

Obtain the specified confidence interval by formula. Use the t-distribution table in Appendix C to find the t values.

Consider a random sample of 25 measurements obtained from a normally distributed population with x ¯ = 450 and σ = 60. Construct a 95% confidence interval.

(A) (429.5, 470.5)

(B) (425.2, 474.8)

(C) (426.5, 473.5)

(D) (443.5, 456.5) B

Obtain the specified confidence interval by formula. Use the t-distribution table in Appendix C to find the t values.

Consider a random sample of 16 measurements obtained from a normally distributed population with x ¯ = 450 and σ = 60. Construct a 99% confidence interval.

(A) (423.7, 476.3)

(B) (420.1, 479.9)

(C) (405.8, 494.2)

(D) (411.4, 488.6) C

Obtain the specified confidence interval by formula. Use the t-distribution table in Appendix C to find the t values.

Consider a random sample of 25 measurements obtained from a normally distributed population with x ¯ = 450 and σ = 60. Construct a 99% confidence interval.

(A) (449.0, 511.0)

(B) (419.1, 480.9)

(C) (425.2, 474.8)

(D) (416.4, 483.6) D

Obtain the specified confidence interval using a graphing

calculator.

Suppose that scores on a standardized exam are normally distributed. To estimate the average score on the exam for all test takers, a researcher obtained a random sample of 25 scores. The sample yielded x ¯ = 480 and σ = 75. Give a 95% confidence interval for the average score on the exam for all test takers.

(A) (454.3, 505.7)

(B) (449.0, 511.0)

(C) (420.1, 479.9)

(D) (474.3, 485.7) B

Obtain the specified confidence interval using a graphing

calculator.

A local deli chain advertises a "heart-healthy" sandwich. Suppose the number of fat grams in a heart-healthy sandwich is a normal random variable. To estimate the average amount of fat grams in the deli's heart-healthy sandwiches, a nutritionist selected a random sample of 4 heart-healthy sandwiches. The sample yielded x ¯ = 11 grams and σ = 1.8 grams. Construct a 90% confidence interval for the average amount of fat grams in a heart-healthy sandwich.

(A) (8.1, 13.9)

(B) (8.9, 13.1)

(C) (5.7, 16.3)

(D) (9.5, 12.5) B

Obtain the specified confidence interval using a graphing

calculator.

A plumbing company has found that the length of time, in minutes, for installing a bathtub is normally distributed. The owner of the company hired a statistician to estimate the average length of time the company takes to install a bathtub. The statistician randomly selected a sample of 10 bathtub installations. The sample yielded x ¯ = 150 minutes and σ = 30 minutes. Construct a 95% confidence interval for the average length of time the company takes to install a bathtub.

(A) (131.4, 168.6)

(B) (134.4, 165.6)

(C) (128.5, 171.5)

(D) (132.6, 167.4) C

Obtain the specified confidence interval using a graphing

calculator.

The weights of newborn baby girls born at a local hospital are normally distributed. A hospital administrator conducted a study to estimate the mean weight of all newborn baby girls born at the hospital. A random sample of size n = 20 had a mean weight of 95 ounces and a standard deviation of 8 ounces. Calculate a 99% confidence interval for the mean weight of all newborn baby girls born at the hospital.

(A) (89.9, 100.1)

(B) (91.3, 98.7)

(C) (91.9, 98.1)

(D) (90.4, 99.6) A

Obtain the specified confidence interval using a graphing

calculator.

The lifetime for a certain brand of incandescent light bulbs is normally distributed. A random sample of 5 of these light bulbs had a mean lifetime of 520 hours and standard deviation of 50 hours. Give a 95% confidence interval for the mean lifetime of all incandescent light bulbs of this brand.

(A) (476.2, 563.8)

(B) (417.1, 622.9)

(C) (472.3, 567.7)

(D) (457.9, 582.1) D

Obtain the specified confidence interval by formula

n = 200, pˆ = 0.2, 90% confidence interval

(A) (0.1446, 0.2554)

(B) (0.0651, 1349)

(C) (0.1535, 0.2465)

(D) (0.1271, 2729) C

Obtain the specified confidence interval by formula

n = 100, pˆ = 0.45, 99% confidence interval

(A) (0.3218, 0.5782)

(B) (0.3682, 0.5318)

(C) (0.3525, 5475)

(D) (0.3862, 0.5138) A

Obtain the specified confidence interval by formula

n = 1,500, x ¯ = 45, 95% confidence interval

(A) (0.0228, 0.0372)

(B) (0.0214, 0.0386)

(C) (0.0187, 0.0413)

(D) (0.0198, 0.0402) B

For which of the following conditions is the stated sample size n large enough for constructing a confidence interval for p?

(A) n = 20, pˆ = 0.2

(B) n = 100, pˆ = 0.03

(C) n = 15, pˆ = 0.6

(D) n = 150, pˆ = 0.99 C

Obtain the margin of error for the specified confidence interval by formula.

n = 15, pˆ = 0.6, 90% confidence interval

(A) 0.2479

(B) 0.3258

(C) 0.1621

(D) 0.2081 D

Obtain the margin of error for the specified confidence interval by formula.

n = 1,000, pˆ = 0.82, 95% confidence interval

(A) 0.0238

(B) 0.0313

(C) 0.0200

(D) 0.0154 A

Obtain the specified confidence interval using a graphing

calculator.

A random check of 500 batteries manufactured by a company found 15 defective batteries. Construct a 95% confidence interval for the proportion of all the company's batteries that are defective.

(A) (0.01505, 0.04495)

(B) (0.01902, 0.04098)

(C) (0.017545, 0.04255)

(D) (0.01035, 0.04965) A

Obtain the specified confidence interval using a graphing

calculator.

Assume a study revealed that from a sample of 80 working women in a metropolitan area, 12 were over the age of 60. Construct a 99% confidence interval for the true proportion of working women over the age of 60 in the metropolitan area.

(A) (0.07175, 0.22825)

(B) (0.04717, 0.25283)

(C) (0.08433, 0.21567)

(D) (0.09884, 0.20116) B

Obtain the specified confidence interval using a graphing

calculator.

A radio station's advertising manager needs to know the proportion of radio listeners in the area who listen to the manager's radio station. Suppose that in a random sample of 100 radio listeners in the area, 34 listen to the manager's station. Construct a 90% confidence interval for the proportion of radio listeners in the area who listen to the manager's radio station.

(A) (0.24715, 0.43285)

(B) (0.21798, 0.46202)

(C) (0.26208, 0.41792)

(D) (0.27181, 0.40819) C

Obtain the specified confidence interval using a graphing

calculator.

An interior designer needs to know the proportion of assisted-living residents who prefer blue for the color of their bedroom walls. In a random survey of 300 assisted-living residents, 80 percent said they prefer blue. Construct a 95% confidence interval for the proportion of all assisted living residents who prefer blue on bedroom walls.

(A) (0.76201, 0.83799)

(B) (0.74071, 0.85949)

(C) (0.77040, 0.82960)

(D) (0.75474, 0.84526) D

Obtain the specified confidence interval using a graphing

calculator.

A market researcher wants to know the percent of households in a rural area that have no vehicle. In a random sample of 120 households, 6 households had no vehicle. Construct a 90% confidence interval for the percent of households in the rural area that have no vehicle.

(A) (0.01727, 0.08273)

(B) (−0.00120, 0.10125)

(C) (0.01101, 0.08899)

(D) (0.02711, 0.07289) A

Find the sample size necessary to estimate the population mean μ to

within the margin of error E = 2 with 95% confidence, given that prior

data suggest σ =10.

(A) 96

(B) 95

(C) 97

(D) 99 C

Find the sample size necessary to estimate the population mean μ to

within the margin of error E = 2 with 95% confidence, given that prior

data suggest σ = 100.

(A) 9,604

(B) 9,603

(C) 960

(D) 961 A

Find the sample size necessary to estimate the population mean μ to

within the margin of error E = 0.2 with 95% confidence, given that prior data suggest σ = 100.

(A) 960,401

(B) 960,400

(C) 960,000

(D) 960,500 B

Find the sample size necessary to estimate the population mean μ to

within the margin of error E = 1.5 with 95% confidence, given that prior data suggest σ = 5.

(A) 420

(B) 42

(C) 43

(D) 430 C

Find the sample size necessary to estimate the population mean μ to

within the margin of error E = 0.15 with 95% confidence, given that prior data suggest that σ = 5.

(A) 4,267

(B) 42,670

(C) 4,269

(D) 4,268 C

Find the sample size necessary to estimate the population proportion p to within the margin of error E = 0.02 with 95% confidence, given that prior data suggest p = 0.1.

(A) 865

(B) 864

(C) 870

(D) 860 A

Find the sample size necessary to estimate the population proportion p to within the margin of error E = 0.02 with 95% confidence, given that prior data suggest p = 0.2.

(A) 1,536

(B) 1,537

(C) 1,538

(D) 1,539 B

Find the sample size necessary to estimate the population proportion p to within the margin of error E = 0.02 with 95% confidence, given that prior data suggest p = 0.5.

(A) 2,400

(B) 2,500

(C) 2,402

(D) 2,401 D

Find the sample size necessary to estimate the population proportion p to within the margin of error E = 0.02 with 95% confidence, given that prior data suggest p = 0.7.

(A) 2,017

(B) 2,016

(C) 2,020

(D) 2,010 A

Find the sample size necessary to estimate the population proportion p to within the margin of error E = 0.02 with 95% confidence, given that prior data suggest p = 0.9.

(A) 864

(B) 865

(C) 866

(D) 867 B

A health professional wants to estimate the birth weights of infants. A previous study indicated that the standard deviation of infant birth weights is 7.6 ounces. What size sample is necessary if the health professional wants to estimate the true mean birth weights of infants to within 1.5 ounces with 99% confidence?

(A) 170

(B) 171

(C) 180

(D) 181 B

A pollster wants to conduct a survey to estimate the proportion of US citizens who favor a certain presidential candidate within a margin of error E = 0.04 ("4 percentage points") with 95% confidence. Assuming no prior information is available, find the minimum required sample size for the pollster's survey.

(A) 60,025

(B) 60,026

(C) 600

(D) 601 D

A manufacturer of car batteries needs to estimate the average life of its batteries. Prior data indicate that the standard deviation of the population of batteries is approximately 8 months. What size sample is necessary if the manufacturer wants to estimate the true average life of its car batteries within 2 months with 90% confidence?

(A) 44

(B) 45

(C) 43

(D) 46 A

The fund-raising officer for a charity organization wants to estimate the average donation from contributors to the charity. Prior data indicate that the standard deviation of charitable contributions to the organization is approximately $95. What size sample is necessary if the fund-raising officer wants to estimate the true average donation from all contributors to the charity within $20 with 95% confidence?

(A) 86

(B) 87

(C) 88

(D) 89 B

A quality-control inspector for a company that makes cell phones needs to estimate the proportion of defective cell phones produced by the company. The quality-control inspector estimates that the proportion defective is about 0.1, corresponding to 10% defective. How many of the company's cell phones should be sampled and checked in order to estimate the proportion of defective cell phones to within 0.01 with 90% confidence?

(A) 2,400

(B) 2,435

(C) 2,436

(D) 2,500 C

Consider the normal random variable X with mean μ = 75 and standard deviation μ = 5. Find the probability that X assumes a value within one standard deviation of the mean.

(A) 0.0456

(B) 0.3174

(C) 0.6826

(D) 0.9974 C

Consider the normal random variable X with mean μ = 75 and standard deviation σ = 5. Find the probability that X assumes a value more than one standard deviation from μ = 75.

(A) 0.0456

(B) 0.3174

(C) 0.6826

(D) 0.9974 B

Consider the normal random variable X with mean μ = 300 and standard deviation σ = 20. Find P (260 < X <340 ).

(A) 0.9544

(B) 0.9500

(C) 0.6826

(D) 0.9974 A

Consider the normal random variable X with mean μ = 300 and standard deviation σ = 20. Find 1 - P (260 < X < 340 )

(A) 0.0026

(B) 0.0456

(C) 0.6826

(D) 0.9974 B

Consider the normal random variable X with mean μ = 200 and standard deviation σ = 25. Find P (125 < X < 275).

(A) 0.3174

(B) 0.6826

(C) 0.9544

(D) 0.9974 D

Consider the normal random variable X with mean μ = 200 and standard deviation σ = 25. Which of the following statements is always true?

(A) P (X < 200) is less than P (X> 200)

(B) P (X< 200) is greater than P (X > 200) .

(C) P (X = 200) equals 0.

(D) P (X= 200) equals 0.5. C

Consider the standard normal random variable Z with mean μ = 0 and standard deviation σ = 1. Find P ( − 1 < Z < 1 )

(A) 0.3174

(B) 0.6826

(C) 0.9544

(D) 0.9974 B

Consider the standard normal random variable Z with mean μ = 0 and standard deviation σ = 1. Find P (−2 <Z< 2).

(A) 0.3174

(B) 0.6826

(C) 0.9544

(D) 0.9974 C

Consider the standard normal random variable Z with mean μ = 0 and standard deviation σ = 1. Find P (−3 < Z < 3).

(A) 0.3174

(B) 0.6826

(C) 0.9544

(D) 0.9974 D

Consider the standard normal random variable Z with mean μ = 0 and standard deviation σ = 1. Find P (Z≥ 0).

(A) 0.0000

(B) 0.2500

(C) 0.5000

(D) 0.9999 C

Consider the standard normal random variable Z with mean μ = 0 and standard deviation σ = 1. Find P (Z = 0).

(A) 0.0000

(B) 0.2500

(C) 0.5000

(D) 0.9999 A

Find the indicated probability.

P (Z< 1.65)

(A) 0.9505

(B) 0.4505

(C) 0.5495

(D) 0.5099 A

Find the indicated probability.

P (Z < 0,08)

(A) 0.5319

(B) 0.3188

(C) 0.7881

(D) 0.4681 A

Find the indicated probability.

P (Z ≤ −1.99)

(A) 0.9767

(B) 0.4767

(C) 0.0233

(D) 0.5233 C

Find the indicated probability.

P (Z ≥ −1.04)

(A) 0.1492

(B) 0.9192

(C) 0.0808

(D) 0.8508 D

Find the indicated probability.

P (Z > 1.85)

(A) 0.0322

(B) 0.9678

(C) 0.4678

(D) 0.0359 A

Find the indicated probability.

P (− 1.2 < Z < 2.4)

(A) 0.1151

(B) 0.8767

(C) 0.1069

(D) 0.8933 B

Find the indicated probability.

P (Z < −1.96)

(A) 0.5250

(B) 0.4750

(C) 0.0250

(D) 0.9750 C

Find the indicated probability.

P (Z ≥ −1 96)

(A) 0.5250

(B) 0.4750

(C) 0.0250

(D) 0.9750 D

Find the indicated probability.

P (− 1.96< Z< 0)

(A) 0.5250

(B) 0.4750

(C) 0.0250

(D) 0.9750 B

Find the indicated probability.

P (0<Z< 1.96)

(A) 0.5250

(B) 0.4750

(C) 0.0250

(D) 0.9750 B

Find the indicated probability.

P (−1.96 < Z < 1.96)

(A) 0.0500

(B) 0.4750

(C) 0.9500

(D) 0.9750 C

Find the indicated probability.

P (Z < −3)

(A) 0.0013

(B) 0.4987

(C) 0.5013

(D) 0.9987 A

Find the indicated probability.

P (Z < 3)

(A) 0.0013

(B) 0.4987

(C) 0.5013

(D) 0.9987 D

Find the indicated probability.

P(Z ≤ 0)

(A) 0.0000

(B) 0.2500

(C) 0.5000

(D) 1.0000 C

Find the indicated probability.

P (Z> 2.33)

(A) 0.9901

(B) 0.4901

(C) 0.0099

(D) 0.5099 C

Find the indicated probability.

P (1.23 < Z ≤ 1.87)

(A) 0.0786

(B) 0.0307

(C) 0.1093

(D) 0.6400 A

Find the indicated probability.

P (0<Z<1.65)

(A) 0.4505

(B) 0.0495

(C) 0.9505

(D) 0.5495 A

Find the indicated probability.

P (− 1< Z <1)

(A) 0.0456

(B) 0.3174

(C) 0.6827

(D) 0.9974 C

P (−1.95 < Z < 1.28)

(A) 0.0003

(B) 0.0747

(C) 0.6700

(D) 0.0256 B

Determine the percentile designation of the given z-score.

z = -2.5

(A) 48th

(B) 62nd

(C) 0.62th

(D) 0.48th C

Determine the percentile designation of the given z-score.

z = 2.5

(A) 62nd

(B) 99.46th

(C) 0.62th

(D) 99.38th D

Determine the percentile designation of the given z-score.

z = -1.49

(A) 6.81th

(B) 8.08th

(C) 0.68th

(D) 0.80th A

Determine the percentile designation of the given z-score.

z = 1.64

(A) 94.84th

(B) 94.95th

(C) 94.52th

(D) 5.05th B

Determine the percentile designation of the given z-score.

z = 0

(A) 0th

(B) 100th

(C) 25th

(D) 50th D

Find the specified percentile z of the standard normal distribution.

90th percentile

(A) z = −1 28.

(B) z = −1 34.

(C) z = 1.34

(D) z = 1.28 D

Find the specified percentile z of the standard normal distribution.

20th percentile

(A) z = -0.84

(B) z = −2 05.

(C) z = 2.05

(D) z = 0.84 A

Find the specified percentile z of the standard normal distribution.

14th percentile

(A) z = −2 99.

(B) z = -1.08

(C) z = 1.08

(D) z = 2.99 B

Find the specified percentile z of the standard normal distribution.

60th percentile

(A) z = -0.25

(B) z = -1.55

(C) z = 0.25

(D) z = 1.55 C

Find the specified percentile z of the standard normal distribution.

3rd percentile

(A) z = -0.52

(B) z = -1.88

(C) z = 0.52

(D) z = 1.88 B

Find the specified z0 of the standard normal distribution.

P (Z < z0 = 0.8771)

(A) z0 = -1.16

(B) z0 = 1.16

(C) z0 = -2.38

(D) z0 = 2.38 B

Find the specified z0 of the standard normal distribution.

P (Z ≤ z0) = 0.0124

(A) z0 = -2.24

(B) z0 = 2.24

(C) z0 = 3.03

(D) z0 = -3.03 A

Find the specified z0 of the standard normal distribution.

P (Z ≤ z0) = 0.9936

(A) z0 = -1.29

(B) z0 = -2.49

(C) z0 = 1.29

(D) z0 = 2.49 D

Find the specified z0 of the standard normal distribution.

P (Z > z0 = 0.975)

(A) z0 = -1.96

(B) z0 = -1.30

(C) z0 = 1.30

(D) z0 = 1.96 A

Find the specified z0 of the standard normal distribution.

P (Z ≥ z0) = 0.119

(A) z0 = 2.37

(B) z0 = -2.37

(C) z0 = 1.18

(D) z0 = -1.18 C

Find the indicated probability.

Consider the normal random variable X with mean μ = 60 and standard deviation σ = 10. Find P (x) = 60 .

(A) 0.0000

(B) 0.2500

(C) 0.5000

(D) 0.9999 A

Find the indicated probability.

Consider the normal random variable X with mean μ = 60 and standard deviation σ = 10. Find P (X) ≤ 60 .

(A) 0.0000

(B) 0.2500

(C) 0.5000

(D) 0.9999 C

Find the indicated probability.

Consider the normal random variable X with mean μ = 60 and standard deviation σ = 10. Find P (50≤ Z ≤ 70)

(A) 0.3174

(B) 0.6826

(C) 0.9544

(D) 0.9974 B

Find the indicated probability.

Find the probability that a normal random variable X with mean μ = 25 and standard deviation σ = 5 is less than 20.

(A) 0.1587

(B) 0.8413

(C) 0.6826

(D) 0.3174 A

Find the indicated probability.

Find the probability that a normal random variable X with mean μ = 300 and standard deviation σ = 50 lies between 150 and 250.

(A) 0.0019

(B) 0.1587

(C) 0.8427

(D) 0.1573 D

Find the indicated probability.

Find the probability that a normal random variable X with mean μ = 30 and standard deviation σ = 6 is at least 40.5.

(A) 0.4006

(B) 0.9599

(C) 0.0401

(D) 0.0004 C

Find the indicated probability.

Find the probability that a normal random variable X with mean μ = 120 and standard deviation σ = 25 is no less than 100.

(A) 0.0788

(B) 0.0212

(C) 0.2119

(D) 0.7881 D

Find the indicated probability.

Find the probability that a normal random variable X with mean μ = 1,600 and standard deviation σ = 200 is at most 1,900.

(A) 0.9332

(B) 0.0668

(C) 0.0933

(D) 0.6680 A

Find the indicated probability.

Find the probability that a normal random variable X with mean μ =

1,600 and standard deviation σ = 200 is at least 1,900.

(A) 0.9332

(B) 0.0668

(C) 0.0933

(D) 0.6680 B

Find the indicated probability.

IQ scores for adults are normally distributed with mean μ = 100 and standard deviation σ = 15. What percent of adults have IQ scores greater than 130?

(A) 0.9772

(B) 0.5987

(C) 0.0228

(D) 0.4013 C

Find the indicated probability.

Suppose that scores on a national exam are normally distributed with mean μ = 500 and standard deviation σ = 100. Find the probability that a randomly selected test taker's score on the exam will be at least 750.

(A) 0.0062

(B) 0.9938

(C) 0.5987

(D) 0.4013 A

Find the indicated probability.

A local deli chain makes a signature sandwich. Suppose the measures of fat grams in the signature sandwiches are normally distributed with mean μ = 16 grams and standard deviation σ = 1.5 grams. Find the probability that a randomly selected signature sandwich will have no more than 19 fat grams.

(A) 0.0228

(B) 0.9772

(C) 0.0977

(D) 0.2275 B

Find the indicated probability.

A plumbing company has found that the length of time, in minutes, for installing a bathtub is normally distributed with mean μ = 160 minutes and standard deviation σ = 25 minutes. What percent of the bathtubs does the company install within 189 minutes?

(A) 0.8473

(B) 0.1523

(C) 0.8770

(D) 0.1230 C

Find the indicated probability.

The weights of newborn baby girls born at a local hospital are normally distributed with mean μ = 100 ounces and standard deviation σ = 8 ounces. If a newborn baby girl born at the hospital is randomly selected, what is the probability that the child's weight will be at least 88 ounces?

(A) 0.0668

(B) 0.1479

(C) 0.4332

(D) 0.9332 D

Determine the probability

The weights of newborn baby boys born at a local hospital are normally distributed with mean μ = 118 ounces and standard deviation σ = 9.5 ounces. What percent of the baby boys born at the hospital weigh between 106.6 and 129.4 ounces?

(A) 76.99%

(B) 23.01%

(C) 38.49%

(D) 61.51% A

Determine the probability

Suppose the caloric content of a 12-ounce can of a certain diet drink is normally distributed with mean μ = 5 calories and standard deviation σ =0.5 calories. What is the probability that a randomly selected 12-ounce can of the diet drink contains no more than 6 calories?

(A) 0.0228

(B) 0.9772

(C) 0.8643

(D) 0.1357 B

Determine the probability

A coffee machine dispenses a mean of 8 ounces per cup. The machine's output is normally distributed with a standard deviation of 1 ounce. If the coffee cups filled by the machine hold 9.5 ounces, find the probability that the machine will overfill a cup.

(A) 0.9332

(B) 0.1440

(C) 0.0668

(D) 0.8560 C

Determine the probability

The lifetime for a certain brand of incandescent light bulbs is normally distributed with a mean lifetime of 480 hours and standard deviation of 40 hours. What percent of these light bulbs last at least 500 hours?

(A) 69.15%

(B) 0.3085%

(C) 30.85%

(D) 0.6915% C

Given that IQ scores are normally distributed with mean μ = 100 and

standard deviation σ = 15, find the 90th percentile of the distribution of IQ scores.

(A) 119.2

(B) 80.8

(C) 90.0

(D) 115.0 A

Given that IQ scores are normally distributed with mean μ = 100 and

standard deviation σ = 15, find the 20th percentile of the distribution of IQ scores.

(A) 112.6

(B) 87.4

(C) 20.0

(D) 84.0 B

Given that IQ scores are normally distributed with mean μ = 100 and

standard deviation σ = 15, find the 50th percentile of the distribution of IQ scores.

(A) 100

(B) 50

(C) 150

(D) 120 A

Consider the normal random variable X with mean μ = 500 and standard deviation σ = 100. Find x0 corresponding to P (X< x0 = 0.8771)

(A) 116

(B) 877

(C) 588

(D) 616 D

Consider the normal random variable X with mean μ = 500 and standard deviation σ = 100. Find x0 corresponding to P (X ≤ x0) = 0.0124

(A) 276

(B) 512

(C) 224

(D) 124 A

Consider the normal random variable X with mean μ = 500 and standard deviation σ = 100. Find x0 corresponding to P (X ≤ x0) = 0.9936.

(A) 249

(B) 599

(C) 994

(D) 749 D

Consider the normal random variable X with mean μ = 500 and standard deviation σ = 100. Find x0 corresponding to P (X < x0) = 0.025.

(A) 205

(B) 250

(C) 304

(D) 498 C

Consider the normal random variable X with mean μ = 500 and standard deviation σ = 100. Find x0 corresponding to P (X ≤ x0) = 0.881.

(A) 118

(B) 382

(C) 881

(D) 618 D

Suppose that scores on a national exam are normally distributed with mean μ = 500 and standard deviation σ = 100. Ninety percent of test-takers score less than what score on the exam?

(A) 450

(B) 372

(C) 590

(D) 628 D

A local deli chain makes a signature sandwich. Suppose the number of fat grams in the signature sandwiches is a normally distributed random variable with mean μ = 16 grams and standard deviation σ = 1.5 grams. Find an amount of fat grams such that 50% of the sandwiches have no more than that many fat grams.

(A) 8

(B) 16

(C) 20

(D) 1.5 B

A plumbing company has found that the length of time, in minutes, for installing a bathtub is normally distributed with mean μ = 160 minutes and standard deviation σ = 25 minutes. Eighty percent of the bathtubs are installed by the company within how many minutes?

(A) 181

(B) 128

(C) 80

(D) 84 A

The weights of newborn baby girls born at a local hospital are normally distributed with mean μ = 100 ounces and standard deviation σ = 8 ounces. Find the weight (to the nearest ounce) for a newborn baby girl born at the hospital for which 25% of the newborn baby girls weigh less.

(A) 95

(B) 25

(C) 75

(D) 105 A

The lifetime for a certain brand of incandescent light bulbs is normally distributed with a mean lifetime of 480 hours and standard deviation of 40 hours. Find a lifetime (in hours) for this brand of incandescent light bulbs for which the probability is 0.9505 that a randomly selected incandescent light bulb of this brand will last at least that long.

(A) 480

(B) 482

(C) 546

(D) 414 D

For which of the following experiments is the binomial distribution an

appropriate model of the experiment's probability distribution?

(A) Toss a six-sided fair die 30 times, and record the up face of

the die.

(B) Toss a six-sided fair die 100 times, and record the number of

times the up face of the die shows five dots.

(C) Count the number of cars entering a car wash in a 30-minute

period.

(D) Randomly draw 30 cards, successively without replacement, from

a well-shuffled deck of 52 playing cards, and observe whether the

card is a diamond. B

For which of the following experiments is the binomial distribution NOT an appropriate model of the experiment's probability

distribution?

(A) Toss two fair coins 10 times, and count the number of tosses in

which two heads appear.

(B) For a quiz consisting of 10 multiple-choice questions, each with

4 possible answer choices (A, B, C, and D), one of which is correct, an unprepared student does not read the question but simply

makes one random guess for each question. Count the number of

correct guesses the student makes for the 5 questions.

(C) The probability that a randomly chosen remote control from a

recent production lot will be defective is 0.15. Randomly select

and test 10 remote controls from the production lot, and record

the number of defective units.

(D) From an urn containing 6 white marbles and 9 black marbles,

randomly draw 10 marbles, successively without replacement, and

record the number of white marbles drawn. D

Calculate μ for a binomial distribution with n = 8 repeated trials and probability of success p = 0.2. (Round your answer, as needed.)

(A) 1.13

(B) 1.28

(C) 1.6

(D) 6.4 C

Calculate σ^2 for a binomial distribution with n = 8 repeated trials and probability of success p = 0.2. (Round your answer, as needed.)

(A) 1.13

(B) 1.28

(C) 1.60

(D) 6.40 B

Calculate σ for a binomial distribution with n = 8 repeated trials and probability of success p = 0.2. (Round your answer, as needed.)

(A) 1.13

(B) 1.28

(C) 1.60

(D) 6.40 A

Calculate μ for a binomial distribution with n = 15 repeated trials and probability of success p = 0.9. (Round your answer, as needed.)

(A) 1.16

(B) 1.35

(C) 1.5

(D) 13.5 D

Calculate σ^2 for a binomial distribution with n = 15 repeated trials and probability of success p = 0.9. (Round your answer, as needed.)

(A) 1.16

(B) 1.35

(C) 1.5

(D) 13.5 B

Calculate σ for a binomial distribution with n = 15 repeated trials and

probability of success p = 0.9. (Round your answer, as needed.)

(A) 1.16

(B) 1.35

(C) 1.5

(D) 13.5 A

Calculate μ for a binomial distribution with n = 100 repeated trials and probability of success p = 0.5. (Round your answer, as needed.)

(A) 100

(B) 50

(C) 25

(D) 5 B

Calculate σ^2 for a binomial distribution with n = 100 repeated trials and probability of success p = 0.5. (Round your answer, as needed.)

(A) 100

(B) 50

(C) 25

(D) 5 C

Calculate σ for a binomial distribution with n = 100 repeated trials and

probability of success p = 0.5. (Round your answer, as needed.)

(A) 100

(B) 50

(C) 25

(D) 5 D

Calculate μ for a binomial distribution with n = 300 repeated trials and Probability of success p = 0.25. (Round your answer, as needed.)

(A) 7.5

(B) 56.25

(C) 75

(D) 225 C

Calculate σ^2 for a binomial distribution with n = 300 repeated trials and probability of success p = 0.25. (Round your answer, as needed.)

(A) 7.5

(B) 56.25

(C) 75

(D) 225 B

Calculate σ for a binomial distribution with n = 300 repeated trials and probability of success p = 0.25. (Round your answer, as needed.)

(A) 7.5

(B) 56.25

(C) 75

(D) 225 A

A quality-control inspector randomly draws 20 light bulbs from a recent production lot and records the number of defective bulbs. Suppose it is known that the probability is 0.15 that a randomly chosen light bulb is defective. Calculate the expected number of defective bulbs.

(A) 3

(B) 5

(C) 10

(D) 17 A

P (X < 1) when n = 5, p = 0.2

(A) 0.328

(B) 0.737

(C) 0.032

(D) 0.672 A

P (X ≤ 1) when n = 5, p = 0.2

(A) 0.328

(B) 0.737

(C) 0.263

(D) 0.672 B

P (X > 8) when n = 10, p = 0.5

(A) 0.989

(B) 0.055

(C) 0.011

(D) 0.945 C

P (X= 2) when n = 3, p = 0.7

(A) 0.216

(B) 0.441

(C) 0.343

(D) 0.657 B

P (X≤ 2) when n = 3, p = 0.7

(A) 0.216

(B) 0.441

(C) 0.343

(D) 0.657 D

P (X< 2) when n = 3, p = 0.7

(A) 0.216

(B) 0.441

(C) 0.343

(D) 0.657 A

P (X> 2) when n = 3, p = 0.7

(A) 0.343

(B) 0.441

(C) 0.657

(D) 0.784 A

P (X ≥ 2) when n = 3, p = 0.7

(A) 0.343

(B) 0.441

(C) 0.657

(D) 0.784 D

P (X= 5) when n = 6, p = 0.4

(A) 0.996

(B) 0.959

(C) 0.037

(D) 0.963 C

P (X ≥ 1) when n = 10, p = 0.5

(A) 0.055

(B) 0.001

(C) 0.989

(D) 0.999 D

P (X is less than 1) when n = 15, p = 0.2

(A) 0.035

(B) 0.167

(C) 0.132

(D) 0.965 A

P (X is less than 8) when n = 10, p = 0.9

(A) 0.263

(B) 0.070

(C) 0.736

(D) 0.930 D

P (X exceeds 8) when n = 10, p = 0.5

(A) 0.055

(B) 0.945

(C) 0.011

(D) 0.989 C

P (X is less than or equal to 3) when n = 12, p = 0.2

(A) 0.205

(B) 0.795

(C) 0.558

(D) 0.236 B

P (X is exactly 17) when n = 19, p = 0.8

(A) 0.154

(B) 0.285

(C) 0.917

(D) 0.000 A

P (X is at most 2) when n = 11, p = 0.4

(A) 0.120

(B) 0.031

(C) 0.089

(D) 0.880 A

P (X is no less than 6) when n = 9, p = 0.7

(A) 0.267

(B) 0.156

(C) 0.463

(D) 0.730 D

P (X is greater than 18) when n = 20, p = 0.9

(A) 0.285

(B) 0.323

(C) 0.392

(D) 0.677 C

P (X is no more than 1) when n = 15, p = 0.2

(A) 0.035

(B) 0.132

(C) 0.167

(D) 0.833 C

P (X is at least 15) when n = 16, p = 0.7

(A) 0.026

(B) 0.974

(C) 0.994

(D) 0.997 A

Toss a six-sided fair die five times, and record the number of dots on the up face of the die. What is the probability that an even number on the up face occurs exactly four times? (Round your answer, as needed.)

(A) 0.003

(B) 0.156

(C) 0.844

(D) 0.969 B

Flip a fair coin three times, and record the up face of the coin. What is the probability that heads shows on the up face no more than two times? (Round your answer, as needed.)

(A) 0.250

(B) 0.500

(C) 0.750

(D) 0.875 D

Suppose researchers determine that a new drug has a 40% chance of preventing a certain flu strain. If the drug is administered to 10 male subjects, what is the probability that the drug will be effective in preventing the flu strain for exactly eight of the male subjects? (Round your answer, as needed.)

(A) 0.012

(B) 0.998

(C) 0.011

(D) 0.989 C

Suppose researchers determine that the chances a pine tree in a particular forest is infected by the pine beetle is 10%. If five randomly selected pine trees in that forest are tested for infection by the pine beetle, what is the probability that exactly two are infected by the pine beetle? (Round your answer, as needed.)

(A) 0.927

(B) 0.008

(C) 0.073

(D) 0.991 C

A quiz consists of five multiple-choice questions, each with four possible answer choices (A, B, C, and D), one of which is correct. Suppose an unprepared student does not read the question but simply makes one random guess for each question. What is the probability that the student will get exactly five questions correct? (Round your answer, as needed.)

(A) 0.001

(B) 0.003

(C) 0.763

(D) 0.999 A

Toss a fair six-sided die 100 times, and record the up face each time. What is the probability that the up face of the die shows five dots at least 20 times? (Round your answer, as needed.)

(A) 0.152

(B) 0.220

(C) 0.780

(D) 0.848 B

A quiz consists of 10 multiple-choice questions, each with 5 possible

answer choices (A, B, C, D, and E), one of which is correct. Suppose an unprepared student does not read the question but simply makes one random guess for each question. What is the probability that the student will get at least 3 questions correct? (Round your answer, as needed.)

(A) 0.322

(B) 0.001

(C) 0.678

(D) 0.879 A

Two cards are drawn at random, successively without replacement, from a well-shuffled standard deck of 52 playing cards. Determine the number of outcomes in the sample space of this experiment.

(A) 104

(B) 2,601

(C) 2,652

(D) 2,704 D

A fair coin is flipped six times, and the up face on each coin is

observed. Determine the number of outcomes in the sample space of this experiment.

(A) 2

(B) 12

(C) 36

(D) 64 D

Find the probability that a number greater than 4 appears on the up face in a single toss of a fair six-sided die.

(A) 1/6

(B) 1/3

(C) 1/2

(D) 2/3 B

Find the probability that a prime or an even number appears on the up face in a single toss of a fair six-sided die.

(A) 1/3

(B) 2/3

(C) 5/6

(D) 1 C

Find the probability that a seven appears on the up face in a single toss of a fair six-sided die.

(A) 0

(B) 1/6

(C) 1

(D) 7/6 A

Find the probability that at least one head appears when two fair coins are flipped and the up face on each is observed.

(A) 1/4

(B) 1/2

(C) 3/4

(D) 1 C

Find the probability that the number of dots on the up faces sum to 7 when a pair of fair six-sided dice is tossed and the up face on each is observed.

(A) 1/12

(B) 1/6

(C) 1/4

(D) 7/36 B

Find the probability of drawing a face card when a single card is drawn at random from a well-shuffled standard deck of 52 playing cards.

(A) 1/12

(B) 3/13

(C) 4/13

(D) 1/4 B

Find the probability of drawing a diamond or a 10 when a single card is drawn at random from a well-shuffled standard deck of 52 playing cards.

(A) 1/13

(B) 7/26

(C) 4/13

(D) 6/13 C

Find the probability of drawing a black or red marble when a single marble is drawn at random from an urn containing 7 black marbles, 6 green marbles, and 10 red marbles. (Assume the marbles are identical except for color.)

(A) 7/23

(B) 10/23

(C) 13/23

(D) 17/23 D

A quiz consists of five multiple-choice questions, each of which has four possible answer choices (A, B, C, and D), one of which is correct. Suppose that an unprepared student does not read the questions but simply makes a random guess for each question. What is the probability that the student will get all five questions wrong?

(A) 0

(B) 1/1,024

(C) 243/1,024

(D) 5-(1-1/4) C

A box contains 30 identical-looking items, of which 3 are defective. If one item is selected at random, what is the probability that the item is defective?

(A) 1/30

(B) 1/11

(C) 1/10

(D) 9/10 C

Find the complement of the following event: A number greater than

four appears on the up face in a single toss of a fair six-sided die.

(A) 5/6

(B) 1/3

(C) 1/2

(D) 2/3 D

Find the complement of the following event: A prime or an even number appears on the up face in a single toss of a fair six-sided die.

(A) 1/3

(B) 2/3

(C) 1/6

(D) 0 C

Find the complement of the following event: drawing a black or red marble when a single marble is drawn at random from an urn containing 7 black marbles, 6 green marbles, and 10 red marbles. (Assume the marbles

are identical except for color.)

(A) 16/23

(B) 10/23

(C) 6/23

(D) 3/23 C

Find the complement of the following event: At least one head appears when two fair coins are flipped and the up face on each is observed.

(A) 1/4

(B) 1/2

(C) 3/4

(D) 0 A

Find the complement of the following event: The number of dots on the up faces sum to 7 when a pair of fair dice is tossed and the up face on each is observed.

(A) 11/12

(B) 5/6

(C) 3/4

(D) 29/36 B

A single marble is drawn at random from an urn containing 2 white marbles, 7 black marbles, 6 green marbles, and 10 red marbles. (Assume the marbles are identical except for color.) What is the probability that the marble drawn is NOT red?

(A)2/5

(B) 3/5

(C)1/3

(D)2/3 B

A quiz consists of five multiple-choice questions, each of which has four possible answer choices (A, B, C, and D), one of which is correct. Suppose that an unprepared student does not read the questions but simply makes a random guess for each question. What is the probability that the student will guess correctly on at least one question?

(A)1/1,024

(B) 1− 1/1,024

(C) 1− 243/1,024

(D) 5\*1/4 C

A box contains 30 identical-looking items, of which 3 are defective. If one item is selected at random, what is the probability that the item is NOT defective?

(A) 1/10

(B) 29/30

(C) 32/33

(D) 9/10 D

Of the following events X and Y, which pair of events is mutually exclusive?

(A) X = drawing a red card on one draw from a standard deck of 52 playing cards; Y = drawing a jack on one draw from a standard deck of 52 playing cards (

B) X = rolling a three on one toss of a fair six-sided die; Y = rolling a number greater than four on one toss of a fair six-sided die

(C) X = rolling an odd number on one toss of a fair six-sided die; Y = rolling a number less than three on one toss of a fair six-sided die

(D) X = drawing a face card on one draw from a standard deck of 52 playing cards; Y = drawing a king on one draw from a standard deck of 52 playing cards B

Given P(A) = 0.5, P(B) = 0.3, and P(A and B) = 0.06, calculate P(A or B).

(A) 0.15

(B) 0.94

(C) 0.80

(D) 0.74 D

Given P(A) = 0.4, P(B) = 0.1, and P A B ( ) ∩ = 0.05, calculate P (A∪B).

(A) 0.04

(B) 0.45

(C) 0.95

(D) 0.50 B

Given P(A) = 0.65, P(B) = 0.22, and P A B ( ) ∩ = 0.08, calculate P (A∪B)

(A) 0.87

(B) 0.92

(C) 0.79

(D) 0.14 C

Given P(A) = 4/52, P(B) = 13/52, and P(A and B) = 1/52 , calculate P(A or B).

(A) 1/52

(B) 4/13

(C) 17/52

(D) 51/52 B

Given P(A) = 3/8 , P(B) = 5/8 , and P (A∩B)= 0, calculate the probability that at least A or B occurs.

(A) 0

(B) 3/8

(C) 15/64

(D) 1 D

What is the probability of rolling an odd number or a number less than three on one roll of a fair six-sided die?

(A) 1/3

(B) 2/3

(C) 5/6

(D) 1 B

One card is randomly drawn from a well-shuffled standard deck of 52 playing cards. Find the probability that the card drawn is an ace or a spade or a diamond.

(A) 15/26

(B) 7/13

(C) 8/13

(D) 27/52 B

Three fair coins are flipped, and the up face on each is observed. Find the probability that at least two heads are observed or the number of heads observed is an odd number.

(A) 1/4

(B) 1/2

(C) 7/8

(D) 1 C

Three fair coins are flipped, and the up face on each is observed. Find the probability that all heads or all tails are observed.

(A) 1/3

(B) 2/3

(C) 1/4

(D) 3/4 C

Given P(A) = 0.4, P(B) = 0.5, and P(A or B) = 0.8, find P(A and B).

(A) 0.1

(B) 0.2

(C) 0.6

(D) 0.9 A

Given P(A) = 0.35, P(B) = 0.63, and P(A∩B) = 0.32, find P(B|A).

(A) 32/63

(B) 32/35

(C) 7/20

(D) It cannot be determined from the information given. B

In which of the following circumstances are the events X and Y independent?

(A) P(X) = 1/2 , P(Y) = 1/2 , P (X∩Y)= 1/4

(B) P(X) = 0.35, P(Y) = 0.63, P (X∩Y) = 0.32

(C) P(X) = 1/2 , P(Y) = 21/55, P(X∩Y) = 3/22

(D) P(X) = 0 .7, P(X|Y) = 0.9 A

What is the probability of rolling an odd number and then a number less than three on two rolls of a fair six-sided die?

(A) 1/6

(B) 1/4

(C) 2/3

(D) 5/6 A

Two cards are randomly drawn, successively without replacement, from a well-shuffled standard deck of 52 playing cards. Find the probability that the first card drawn is an ace and the second card drawn is a face card.

(A) 1/3

(B) 4/13

(C) 11/663

(D) 4/221 D

Three fair coins are flipped, and the up face on each is observed. Find the probability of observing all heads.

(A) 1/8

(B) 1/6

(C) 1/4

(D) 1/3 A

Two cards are randomly drawn, successively with replacement, from a well-shuffled standard deck of 52 playing cards. Find the probability that the first card drawn is a face card and the second card drawn is a number greater than 7 but less than 10.

(A) 8/221

(B) 6/169

(C) 12/169

(D) 5/13 B

Suppose you draw two marbles, successively with replacement, from a box containing eight red marbles and six blue marbles. Find the probability of drawing a blue marble on the second draw, given that you drew a red marble on the first draw. (Assume the marbles are identical except for color.)

(A) 12/49

(B) 3/7

(C) 6/13

(D) 24/91 B

Only one of 100 cell phones in a box is defective. The cell phones are randomly selected and tested one at a time. If the first 30 cell phones tested are not defective, what is the probability that the next cell phone selected and tested is defective?

(A) 99/100

(B) 1/70

(C) 3/7

(D) 7/10 B

The probability diagram shown represents the incidence of Internet failure during weather in which snow might occur. What is the probability that it snows and an Internet failure occurs?

No snow

Snow

(A) 9%

(B) 0.4%

(C) 39.6%

(D) 51% A

Which shows the residence status, by sex, of 250 seniors at a community college: Residence Status of Senior Students (n = 250) On Campus/Off-Campus Female:52/86 Male: 38/74

If one of the 250 students is randomly selected, what is the probability that the student resides on campus, given that the student selected is a male student? Express your answer as a decimal rounded to two places.

(A) 0.51

(B) 0.34

(C) 0.42

(D) 0.15 B

Which shows the residence status, by sex, of 250 seniors at a community college: Residence Status of Senior Students (n = 250) On Campus/Off-Campus Female:52/86 Male: 38/74

If one of the 250 students is randomly selected, what is the probability that the student is a female and resides off campus?

(A) 0.34

(B) 0.38

(C) 0.21

(D) 0.62 A

How many different meal combinations consisting of one sandwich, one drink, and one type of chips are possible from a selection of 8 kinds of sandwiches, 5 drinks, and 7 types of chips?

(A) 20

(B) 35

(C) 40

(D) 280 D

A code for a locking briefcase consists of five digits that must be entered in a definite order. Each of the digits 0 through 9 may be used in the code, and repetition of digits is allowed. How many different five-digit codes are possible?

(A) 100,000

(B) 59,049

(C) 30,240

(D) 15,120 A

There are 30 separate candidates for three vice president positions at a university. Assuming all 30 candidates are qualified to be selected for any one of the three VP positions, how many different ways can the positions be filled?

(A) 27,000

(B) 24,360

(C) 4,060

(D) 60 B

Suppose a high school issues each student a student identification (ID) number that consists of two letters followed by six digits (0 through 9). Assuming repetition of letters and digits is not allowed, how many unique student ID numbers are possible?

(A) 26^9\*2^6 ⋅

(B) (26 2)(10 6)

(C) 26^2\*10^6 ⋅

(D) 26\*25 10\* 9\* 8\*7 \*6 \*5 C

In a certain state, the alphanumeric code for a car license plate consists of three letters followed by three digits (0 through 9). For that state, how many different car license plate alphanumeric codes are possible if repetition of digits and letters is allowed?

(A) 36^6

(B) 26^3\* 10 ^3

(C) 26^3 9^3

(D) (26 3) (10 3) B

For the area code 936, how many seven-digit telephone numbers that begin with 564- are possible if repetition of digits is allowed?

(A) 10^4

(B) 3 \* 10^4 ⋅

(C) 10 \*9\* 8\* 7

(D) 10^7 A

Suppose a code is dialed by means of three disks, each of which is stamped with 15 letters. How many three-letter codes are possible using the three disks?

(A) 15C3

(B) 15^3

(C) 15\*14 \*13

(D) 15\*3 B

How many three-digit codes are possible using only the digits 1 and 0 if repetition of digits is allowed?

(A) 2

(B) 4

(C) 6

(D) 8 D

In how many different ways is it possible to seat three people in three chairs?

(A) 1

(B) 6

(C) 9

(D) 27 B

How many different ways can you arrange the five letters in the word chair if you use all five letters each time?

(A) 5P5

(B) 5C5

(C) 5^5

(D) 5^2 A

Four people are to be seated in four identical chairs placed in a circle. How many different arrangements of the four people (relative to one another) in the four chairs are possible?

(A) 4^4

(B) 4C4

(C) 4P4

(D) 3P3 D

Eight of 10 people are selected to be seated in 8 chairs placed in a straight row. How many different arrangements of the 10 people in the 8 chairs are possible?

(A) 10^8

(B) 10\*8

(C) 10P8

(D) 10C8 C

How many different 10-letter arrangements of the 10 letters in the word statistics are possible?

(A) 10!/2!

(B) 10!/ 2!8!

(C) 10!/3!3!2!

(D) 10!/ 3! 2! C

How many different ways can a club of 25 members fill the positions of president, vice president, and secretary from its membership if no person holds more than one office and all members are eligible for any one of the three positions?

(A) 75

(B) 2,300

(C) 13,800

(D) 15,625 C

How many six-digit (0 through 9) passwords are possible if repetition of digits is not allowed?

(A) 10^6

(B) 10P6

(C) 10C6

(D) 10P4 B

How many different ways can a club of 20 members fill the positions on a 3-member officer-nominating committee from its membership if all members are eligible to serve on the committee?

(A) 60

(B) 1,140

(C) 6,840

(D) 8,000 B

How many 5-card hands are possible from a standard deck of 52 playing cards if the cards are drawn without replacement?

(A) 52^5

(B) 52P5

(C) 52C5

(D) 52\*5 C

How many combinations of 3 pizza toppings can be created from a choice of 12 toppings if each topping can be used only once on a pizza?

(A) 48

(B) 220

(C) 1,320

(D) 1,728 B

How many combinations of 7 out of 15 patients with the same illness can be randomly selected to receive an experimental drug?

(A) 15!/ 7! 8 !

(B) 15 ! /8 !

(C) 15!/ 7 !

(D) 15^3 A

How many different wardrobes can be created by selecting 5 out of 8 different shirts, 4 out of 10 different pairs of slacks, and 3 out of 6 different ties?

(A) 5\* 8 + 4 \*10 +3 \*6

(B) 5 ^4 \* 3^ 8 \* 10 ^6

(C) 8C5 \*10C4 \* 6C3

(D) 8P5\* 10P4+ 6P3 C

Which of the following illustrates quantitative data?

(A) foremost colors (red, yellow, orange, or other colors) of flowers in a

garden

(B) sex (male or female) of users of a website

(C) lengths (in meters) of broad jumps

(D) satisfaction ratings (on a scale from "not satisfied" to "very satisfied") by users of a website C

Which of the following illustrates quantitative data?

(A) ten-digit US social security numbers of students in a classroom

(B) college classifications (freshman, sophomore, junior, senior)

(C) flavors of ice cream

(D) weights (in pounds) of newborns at a regional hospital D

Which of the following does NOT illustrate quantitative data?

(A) freezing temperatures (on a Celsius scale) of chemical mixtures

(B) heights (in centimeters) of plants

(C) survey responses (on a scale from "strongly disagree" to "strongly

agree") of likely voters

(D) number (0, 1, 2, or a greater integer) of people attending a

conference C

Which of the following illustrates qualitative data?

(A) eye colors (blue, brown, green, hazel) of babies

(B) distances (in miles) traveled by students commuting to school

(C) heights (in inches) of students in a classroom

(D) number (0, 1, 2, or a greater integer) of students absent from school A

Which of the following illustrates qualitative data?

(A) number (0, 1, 2, or a greater integer) in favor of school uniforms

(B) names (first and last names) of students who took an exam

(C) ages (in months) of a class of preschool children

(D) costs (in dollars and cents) of tuition at four-year universities in a particular state B

Which of the following does NOT illustrate qualitative data?

(A) ten-digit US social security numbers of students in a classroom

(B) numbers on football jerseys

(C) heights (in centimeters) of plants

(D) customer ratings (on a scale from "very unpleasant" to "very pleas-

ant") of an online-purchase experience C

Eye colors (blue, brown, green, hazel) of babies

(A) nominal

(B) ordinal

(C) interval

(D) ratio A

Distances (in miles) traveled by students commuting to school

(A) nominal

(B) ordinal

(C) interval

(D) ratio D

Number (0, 1, 2, or a greater integer) of students in a classroom

(A) nominal

(B) ordinal

(C) interval

(D) ratio D

Survey responses (on a scale from "strongly disagree" to "strongly agree")

of likely voters

(A) nominal

(B) ordinal

(C) interval

(D) ratio B

Which of the following levels of measurement generally is/are considered

qualitative data?

I. nominal

II. ordinal

III. interval

IV. ratio

(A) I only

(B) I and II only

(C) III only

(D) III and IV only B

Which of the following levels of measurement generally is/are considered

quantitative data?

I. nominal

II. ordinal

III. interval

IV. ratio

(A) I only

(B) I and II only

(C) III only

(D) III and IV only D

Which of the following illustrates discrete data?

(A) number of brown-eyed children in a classroom

(B) distances (in miles) traveled by students commuting to school

(C) heights (in inches) of students in a classroom

(D) survey responses (on a scale from "strongly disagree" to "strongly

agree") of likely voters A

Which of the following illustrates discrete data?

(A) number (0, 1, 2, or a greater integer) in favor of school uniforms

(B) initial weights (in pounds) of participants in a weight-loss program

(C) ages (in months) of a class of preschool children

(D) weights (in ounces) of boxes of cereal A

Which of the following illustrates continuous data?

(A) number of students in a classroom

(B) number of patients who improved after receiving an experimental drug

(C) heights (in centimeters) of plants

(D) number of customers who rated an online-purchasing experience as

"very pleasant" C

Which of the following illustrates continuous data?

(A) ten-digit US social security numbers of students in a classroom

(B) number of female users of a website

(C) lengths (in meters) of broad jumps

(D) satisfaction ratings (on a scale from "not satisfied" to "very satisfied")

by users of a website C

The table shown displays the results of a poll that asked 240 college

students to identify their favorite movie genre. If a circle graph is con-

structed using the data in the table, what central angle should be used to

represent the category comedy/romantic comedy?

Movie Genre Preference

Genre / Number of Students

Action/adventure 33

Drama 16

Comedy/romantic comedy 76

Musical 11

Mystery/crime 12

Horror/suspense/occult 48

Science fiction/fantasy 35

Other 9

Total 240

(A) 32°

(B) 76°

(C) 114°

(D) 246° C

The circle graph shown displays a budget for a monthly income of $3,500

(after taxes). According to the graph, how much more money is budgeted

for rent than for food and clothing combined?

Clothing17%

Entertainment8%

Food17%

Miscellaneous12%

Rent40%

Savings6%

Monthly Budget

(A) $210

(B) $595

(C) $1,190

(D) $1,400 A

According to the pictograph shown, how many of the 40 cat owners surveyed responded "yes" to the question "Do you own a dog?"

Responses of 40 Cat Owners to the Question "Do You Own a Dog?"

Yes: 12 (owners)

No: 28 (owners)

(A) 6

(B) 12

(C) 14

(D) 28 A

Consider the following bar graph. Exactly how many students passed the chemistry course (that is, achieved a grade of D or better)?

(A) 32

(B) 34

(C) 36

(D) 38 C

Consider the following double line graph. What was the lowest monthly profit (revenues - expenses)? C

According to the stem-and-leaf plot, what is the difference between the oldest age at which a US president was inaugurated and the youngest age at which a US president was inaugurated?

(A) 11

(B) 18

(C) 20

(D) 27 D

According to the stem-and-leaf plot, how many of the 44 US presidents

were 64 or older at inauguration?

(A) 10

(B) 5

(C) 4

(D) 3 B

According to the stem-and-leaf plot, what starting weight occurs most often?

(A) 128

(B) 134

(C) 145

(D) 162 C

According to the stem-and-leaf plot, approximately what percent of the

36 female participants have a starting weight of at least 145 pounds?

(A) 33%

(B) 44%

(C) 50%

(D) 58% D

According to the dot plot, how many customers waited less than 15 minutes

in line?

(A) 10

(B) 12

(C) 13

(D) 15 B

According to the dot plot, what is the greatest amount of time in minutes

waited in line by a customer?

(A) 15

(B) 17

(C) 19

(D) 20 C

Consider the following frequency distribution. What is the class width of the distribution?

Prices of Seventy 46è Flat-Screen Televisions

Price (in US Dollars)/ Frequency

500.00-799.99 : 15

800.00-1,099.99 : 25

1,100.00-1,399.99 : 13

1,400.00-1,699.99 : 9

1,700.00-1,999.99 : 8

(A) 99.99

(B) 299.99

(C) 1,399.99

(D) 1,499.99 B

Consider the following frequency distribution. What is the midpoint of

the class with the highest frequency?

Prices of Fifty 46è Flat-Screen Televisions

Price (in US Dollars) /Frequency

500.00-799.99 ; 10

800.00-1,099.99 ; 17

1,100.00-1,399.99 ; 11

1,400.00-1,699.99 ; 8

1,700.00-1,999.99 ; 4

(A) 649.995

(B) 949.995

(C) 1,249.995

(D) 1,549.995 B

Based on the frequency histogram shown, about how many students consume fewer than 16 soft drinks per week?

(A) 10

(B) 50

(C) 85

(D) 110 D

Describe the shape of the distribution shown.

(A) skewed left

(B) negatively skewed

(C) positively skewed

(D) not skewed C

Four stores (Store 1, Store 2, Store 3, and Store 4) jointly sold 100 units of each of four different products, A, B, C, and D. Based on the stacked bar chart shown, which store sold 25% of the 400 total units sold by the four stores?

(A) Store 1

(B) Store 2

(C) Store 3

(D) Store 4 C

Find the mean of the following data:

15, 15, 33, 17, 30, 30, 20, 60, 45, 15

(A) 15

(B) 25

(C) 28

(D) 45 C

Find the mean of the following data:

-4, 25, -4, 11, 19, 4

(A) -4

(B) 7.5

(C) 8.5

(D) 51 C

Find the mean of the following data:

4.7, 5.6, 2.5, 4.9, 7.3, 4.7, 5.6, 6.5

(A) 5.225

(B) 5.250

(C) 5.275

(D) 5.600 A

Find the mean of the following data:

0, 0, 0, 0, 0, 100, 100, 100, 100, 1400

(A) 0

(B) 50

(C) 180

(D) 360 C

Find the mean of the following data:

-15, -15, -33, -17, -30, -30, -20, -60, -45, -15

(A) -15

(B) -25

(C) -28

(D) -45 C

Find the median of the following data:

15, 15, 33, 17, 30, 30, 20, 60, 45, 15

(A) 15

(B) 25

(C) 28

(D) 45 B

Find the median of the following data:

-4, 25, -4, 11, 19

(A) -4

(B) 7.5

(C) 8.5

(D) 11 D

Find the median of the following data:

4.7, 5.6, 2.5, 4.9, 7.3, 4.7, 5.6, 6.5

(A) 5.225

(B) 5.250

(C) 5.275

(D) 5.600 B

Find the median of the following data:

0, 0, 0, 0, 0, 100, 100, 100, 100, 1400

(A) 0

(B) 50

(C) 180

(D) 360 B

Find the median of the following data:

-15, -15, -33, -17, -30, -30, -20, -60, -45, -15

(A) -15

(B) -25

(C) -28

(D) -45 B

Find the mode of the following data:

15, 15, 33, 17, 30, 30, 20, 60, 45, 15

(A) 15

(B) 25

(C) 28

(D) There is no mode. A

Find the mode of the following data:

-4, 25, 25, -4, 11, 11, 19, 19, 8, 8

(A) -4

(B) 11

(C) 12

(D) There is no mode. D

Find the mode of the following data:

4.7, 5.6, 2.5, 4.9, 7.3, 4.7, 5.6, 6.5

(A) 4.7

(B) 5.6

(C) 4.7 and 5.6

(D) There is no mode. C

Find the mode of the following data:

0, 0, 0, 0, 0, 100, 100, 100, 100, 1400

(A) 0

(B) 100

(C) 0 and 100

(D) There is no mode. A

Find the mode of the following data:

-15, -15, -33, -17, -30, -15, -30, -20, -20, -60, -45, -15

(A) -15

(B) -15 and -30

(C) -15, -20, and -30

(D) There is no mode. A

A student's exam score average is a weighted mean of five exam scores.

Find the student's exam score average, where the weighted mean is com-

puted according to the following table.

Exam /Score /Weight

Exam 1 /80 /10%

Exam 2/ 70 /15%

Exam 3 /55 /20%

Exam 4 /90 /25%

Exam 5 /60 /30%

(A) 70

(B) 71

(C) 72

(D) 73 A

In determining the numerical course grade for a freshman psychology

class, the instructor calculates a weighted average as shown in the table. A

student has scores of 78, 81, and 75 on the 3 unit exams, an average of 92

on weekly quizzes, and a final-exam score of 75. To the nearest tenth, what

is this student's numerical course grade?

Determination of Course Grade /Percent

Average (mean) of 3 unit exams /50%

Average (mean) of weekly quizzes /10%

Final-exam score /40%

(A) 78.2

(B) 80.2

(C) 82.2

(D) 84.2 A

In the following data set, what additional number should be included in

the data set to yield a mean of 10?

5, 8, 10, 12, \_\_\_

(A) 8

(B) 10

(C) 12

(D) 15 D

A student has the following scores on three 100-point tests: 77, 91, and

94. What score must the student earn on the fourth 100-point test to have

an average (mean) of 90 for the four tests?

(A) 90

(B) 95

(C) 98

(D) 100 C

Consider the following line graph. To the nearest thousand dollars, determine the mean monthly revenues.

Monthly Revenues for First Half of Year

(A) $120,000

(B) $117,000

(C) $140,000

(D) $113,000 D

Considering the bar graph, determine the median rating of the new

product.

(A) 2.5

(B) 3

(C) 3.5

(D) 4 B

What is the modal rating of the new product in the bar graph?

(A) 0, 2, and 4

(B) 0 and 2

(C) 4

(D) 19 C

To the nearest tenth, what is the mean starting weight in pounds of the 36 participants?

(A) 140.0

(B) 145.0

(C) 145.5

(D) 145.8 D

To the nearest tenth, what is the median starting weight in pounds of the

36 participants?

(A) 140.0

(B) 145.0

(C) 145.5

(D) 145.8 C

What is the modal starting weight in pounds of the 36 participants?

(A) 128

(B) 145

(C) 162

(D) There is no mode. B

To the nearest tenth, what is the mean number of minutes the 16 customers

waited in line?

(A) 10.0

(B) 10.3

(C) 10.5

(D) 11.0 B

According to the dot plot, to the nearest tenth, what is the median number

of minutes the 16 customers waited in line?

(A) 10.0

(B) 10.3

(C) 10.5

(D) 12.5 A

According to the dot plot, what is the modal number of minutes the 16 customers waited in line?

(A) 5

(B) 10

(C) 15

(D) There is no mode. B

Describe the skewness of the dot plot shown.

(A) strongly positively skewed

(B) slightly positively skewed

(C) strongly negatively skewed

(D) slightly negatively skewed B

The table shown displays the classification of 240 movies according to genre.

Which measure of central tendency is most appropriate for describing the data?

Genre /Number of Movies

Action/adventure ; 33

Drama ; 16

Comedy/romantic comedy ; 76

Musical ; 11

Mystery/crime ; 12

Horror/suspense/occult ; 48

Science fiction/fantasy ; 35

Other ; 9

Total ; 240

(A) mean

(B) median

(C) mode

(D) none of the above C

Which measure of central tendency is most appropriate for describing the population data set associated with the histogram shown here?

Weekly Soft Drink Consumption of 120 High School Students

(A) mean

(B) median

(C) mode

(D) none of the above B

Which measure of central tendency is most appropriate for describing the

population data set associated with the graph shown?

Daily production

(A) mean

(B) median

(C) mode

(D) none of the above A

Refer to graph for question 63. For this histogram, which of the following statements is always true?

(A) The mean is greater than the median.

(B) The median is greater than the mean.

(C) The mean and median are equal.

(D) The mean and mode are equal. A

For the histogram shown, which of the following statements is always true?

Variable X

(A) The mean is greater than the median.

(B) The median is greater than the mean.

(C) The mean and median are equal.

(D) The mean and mode are equal. B

Which measure(s) of central tendency is/are very sensitive to outliers?

I. mean

II. median

III. mode

(A) I only

(B) II only

(C) III only

(D) I and II only A

Which of the following is the symbol commonly used for the population mean?

(A) σ

(B) σ^2

(C) M

(D) X-bar C

Which of the following is the symbol commonly used for the sample

mean?

(A) σ

(B) σ^2

(C) M

(D) X-bar D

Consider the stem-and-leaf plot shown. Which of the following best

describes the shape of this distribution?

Stem Leaves

(A) skewed right

(B) skewed left

(C) symmetric—unimodal

(D) symmetric—multimodal C

Find the range of the following data:

15, 33, 30, 50, 0

(A) 15

(B) 20

(C) 17

(D) 50 D

Find the range of the following data:

−4, 25, −4, 11, 19, 4

(A) 8

(B) 15

(C) 21

(D) 29 D

Find the range of the following data:

−15, −15, −33, −17, −30, −30, −20, −60, −45, −15

(A) −75

(B) −45

(C) 45

(D) 75 C

Find the range of the data associated with the line graph shown.

Semi-Annual Monthly Revenue Sales

(A) $20,000

(B) $40,000

(C) $60,000

(D) $80,000 D

Find the range of the data associated with the stem-and-leaf plot shown.

Starting Weights in Pounds of 36 Female Students

Participating in a Weight-Loss Program

(A) 7

(B) 9

(C) 40

(D) 46 D

Find the range of the data associated with the dot plot shown.

Number of Minutes 16 Customers

Waited in Line

(A) 14

(B) 15

(C) 19

(D) 20 A

Both the variance and standard deviation are intended to provide a measure of the variability of a set of data values about which of the following?

(A) mean

(B) median

(C) mode

(D) range A

Which of the following symbols commonly is used for the population

variance?

(A) σ

(B) σ^2

(C) s

(D) s^2 B

Which of the following symbols commonly is used for the sample

variance?

(A) σ

(B) σ^2

(C) s

(D) s^2 D

Which of the following symbols commonly is used for the population

standard deviation?

(A) σ

(B) σ^2

(C) s

(D) s^2 A

Which of the following symbols commonly is used for the sample standard

deviation?

(A) σ

(B) σ^2

(C) s

(D) s^2 C

Consider the following data as a population, and calculate the variance to three decimal places.

15, 33, 30, 50, 0

(A) 359.300

(B) 287.440

(C) 18.955

(D) 16.954 B

Consider the following data as a sample, and calculate the variance to three decimal places.

15, 33, 30, 50, 0

(A) 359.300

(B) 287.440

(C) 18.955

(D) 16.954 A

Consider the following data as a population, and calculate the standard deviation to two decimal places.

−4, 25, −4, 11, 19, 4

(A) 144.30

(B) 120.25

(C) 12.01

(D) 10.97 D

Consider the following data as a sample, and calculate the standard deviation to two decimal places.

−4, 25, −4, 11, 19, 4

(A) 144.30

(B) 120.25

(C) 12.01

(D) 10.97 C

Consider the following data as a population, and calculate the variance to three decimal places.

4.7, 5.6, 2.5, 4.9, 7.3, 4.7, 5.6, 6.5

(A) 1.337

(B) 1.429

(C) 1.787

(D) 2.042 C

Consider the following data as a sample, and calculate the variance to three decimal places.

4.7, 5.6, 2.5, 4.9, 7.3, 4.7, 5.6, 6.5

(A) 1.337

(B) 1.429

(C) 1.787

(D) 2.042 D

Consider the following data as a population, and calculate the standard deviation to three decimal places.

4.7, 5.6, 2.5, 4.9, 7.3, 4.7, 5.6, 6.5

(A) 1.337

(B) 1.429

(C) 1.787

(D) 2.042 A

Consider the following data as a sample, and calculate the standard deviation to three decimal places.

4.7, 5.6, 2.5, 4.9, 7.3, 4.7, 5.6, 6.5

(A) 1.337

(B) 1.429

(C) 1.787

(D) 2.042 B

Consider the following data as a population, and calculate the standard deviation to three decimal places.

−70, −60, −50, −50, −40, −30

(A) −12.910

(B) −14.142

(C) 14.142

(D) 12.910 D

Consider the following data as a sample, and calculate the standard deviation to three decimal places.

−70, −60, −50, −50, −40, −30

(A) −12.910

(B) −14.142

(C) 14.142

(D) 12.910 C

Using a graphing calculator, find the standard deviation of the sample data associated with the line graph shown. (Round your answer to the

nearest dollar.)

Semi-Annual Monthly Revenue Sales

(A) $11,333

(B) $30,111

(C) $27,487

(D) $68,000 B

Using a graphing calculator, find the standard deviation of the sample data associated with the stem-and-leaf plot shown. (Round your answer, as needed.)

(A) 66.60

(B) 62.16

(C) 8.16

(D) 7.88 C

Using a graphing calculator, find the standard deviation of the sample data associated with the dot plot shown. (Round your answer, as needed.)

Number of Minutes 16 Customers

Waited in Line

(A) 4.2

(B) 4.3

(C) 10.3

(D) 18.9 B

The summary statistics in the following table are based on five repetitions of the same experiment performed by four different groups of students: Group A, Group B, Group C, and Group D. The mean value of which group is most reliable?

Summary Statistics of Experiment Based on 5 Trials

Group ; Mean ; Standard Deviation

A ; 25 cm ; 5 cm

B ; 28 cm ; 7 cm

C ; 31 cm ; 6 cm

D ; 25 cm ; 9 cm

(A) Group A

(B) Group B

(C) Group C

(D) Group D A

Consider the following data as a sample. Which of the following statements is true?

50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50

(A) The data are positively skewed.

(B) The mode is 15.

(C) The variance is zero.

(D) The range is 50. C

Consider the following data as a sample. If each data value is increased by 5, what is the effect on the mean and standard deviation?

15, 15, 33, 17, 30, 30, 20, 60, 45, 15

(A) Both the mean and the standard deviation increase by 5.

(B) The mean remains the same, but the standard deviation increases by 5.

(C) The standard deviation remains the same, but the mean increases by 5.

(D) Both the mean and the standard deviation remain the same. C

Which of the following measures is the best measure of location for

describing skewed population data?

(A) mean

(B) median

(C) mode

(D) range B

Which of the following measures is the best measure of location for

describing sample data?

(A) mean

(B) median

(C) mode

(D) standard deviation A

Consider the sample data displayed in the following dot plot. Find

Pearson's coefficient of skewness for these data. (Round your answer, as needed.)

Number of Minutes 16 Customers

Waited in Line

(A) −0.222

(B) −0.216

(C) 0.216

(D) 0.222 C

Consider the following data as a population, and find Pearson's coefficient of skewness for these data. (Round your answer, as needed.)

0, 0, 0, 0, 0, −100, −100, −100, −100, −1,400

(A) −0.953

(B) −0.904

(C) 0.904

(D) 0.953 A

Data from a population yield μ = 360 and σ = 4.5. Find the coefficient of variation for these data.

(A) 0.0125%

(B) 1.25%

(C) 80%

(D) 8,000% B

Data from a sample yield x-bar = 82 and s = 16.4. Find the coefficient of variation for these data.

(A) 0.2%

(B) 20%

(C) 5%

(D) 500% B

The summary statistics in the following table are based on five repetitions of the same experiment performed by four different groups of students: Group A, Group B, Group C, and Group D. The data of which group has the least relative variability?

Summary Statistics of Experiment Based on 5 Trials

Group ; Mean x-bar ; Standard Deviation s

A ; 25 cm ; 5 cm

B ; 28 cm ; 7 cm

C ; 31 cm ; 6 cm

D ; 25 cm ; 9 cm

(A) Group A

(B) Group B

(C) Group C

(D) Group D C

Consider the following data and determine the 80th percentile.

15, 15, 33, 17, 30, 30, 20, 60, 45, 15

(A) 8

(B) 33

(C) 39

(D) 45 C

Consider the following data and determine the 50th percentile.

-4, 25, -4, 11, 19, 4

(A) -4

(B) 3.5

(C) 7.5

(D) 11 C

Consider the following data and determine the 70th percentile.

4.5, 5.6, 2.5, 4.5, 7.3, 4.8, 6.6, 6.6

(A) 5.6

(B) 6.1

(C) 6.6

(D) 5.2 C

Consider the following data and determine the 90th percentile.

0, 0, 0, 0, 0, 100, 100, 100, 100, 1400

(A) 90

(B) 100

(C) 750

(D) 1400 C

Consider the following data and determine the 35th percentile.

−15, −15, −33, −17, −30, −30, −20, −60, −45, −15

(A) −17

(B) −39

(C) −33

(D) −30 D

Consider the bar graph shown. Determine the 25th percentile.

Ratings of a New Product by 48 Customers

on a Scale from 0 (Lowest) to 5 (Highest)

(A) 1

(B) 1.5

(C) 2

(D) 2.5 B

Consider the stem-and-leaf plot shown. Determine the 95th percentile.

Starting Weights in Pounds of 36 Female Students

Participating in a Weight-Loss Program

(A) 162

(B) 165

(C) 167

(D) 169 B

Consider the dot plot shown. Determine the 37.5th percentile.

Number of Minutes 16 Customers

Waited in Line

(A) 6

(B) 8

(C) 9

(D) 10 C

In a population of 320 employees of a manufacturing plant, the mean salary is $55,000 with a standard deviation of $4,000. The median salary is $48,000, and the 60th percentile is $57,500.

Which of the following statements is always true?

(A) The salary data are skewed to the left.

(B) Fifty percent of the employees have salaries of at least $55,000.

(C) Sixty percent of the employees have salaries that are less than

$57,500.

(D) Ten percent of the employees have salaries between $55,000 and

$57,500. C

In a population of 320 employees of a manufacturing plant, the mean salary is $55,000 with a standard deviation of $4,000. The median salary is $48,000, and the 60th percentile is $57,500.

How many employees have salaries that are greater than $57,500?

(A) 40

(B) 128

(C) 160

(D) 192 B

In a population of 320 employees of a manufacturing plant, the mean salary is $55,000 with a standard deviation of $4,000. The median salary is $48,000, and the 60th percentile is $57,500.

Which of the following salaries has a percentile rank of 50?

(A) $48,000

(B) $51,500

(C) $55,000

(D) $57,500 A

In a population of 320 employees of a manufacturing plant, the mean salary is $55,000 with a standard deviation of $4,000. The median salary is $48,000, and the 60th percentile is $57,500.

How many employees have salaries between $48,000 and $57,500?

(A) 10

(B) 32

(C) 50

(D) It cannot be determined from the information given. B

In a population of 320 employees of a manufacturing plant, the mean salary is $55,000 with a standard deviation of $4,000. The median salary is $48,000, and the 60th percentile is $57,500.

How many employees have salaries between $55,000 and $57,500?

(A) 10

(B) 32

(C) 50

(D) It cannot be determined from the information given. D

In a population of 320 employees of a manufacturing plant, the mean salary is $55,000 with a standard deviation of $4,000. The median salary is $48,000, and the 60th percentile is $57,500.

What is the z-score for a salary of $57,500?

(A) 0.625

(B) 0.600

(C) 2.375

(D) 1.600 A

In a population of 320 employees of a manufacturing plant, the mean salary is $55,000 with a standard deviation of $4,000. The median salary is $48,000, and the 60th percentile is $57,500.

What is the z-score for the median?

(A) -1.75

(B) -0.500

(C) 0.500

(D) 1.75 A

In a population of 320 employees of a manufacturing plant, the mean salary is $55,000 with a standard deviation of $4,000. The median salary is $48,000, and the 60th percentile is $57,500.

Which of the following salaries has a z-score of 1.25?

(A) $50,000

(B) $53,000

(C) $60,000

(D) $62,500 C

The mean weight of a population of 4,000 middle-school girls is 80 pounds with a standard deviation of 14 pounds. The 15th percentile has a z-score of −1.5.

What weight (in pounds) is the 15th percentile?

(A) 21

(B) 59

(C) 61

(D) 101 B

The mean weight of a population of 4,000 middle-school girls is 80 pounds with a standard deviation of 14 pounds. The 15th percentile has a z-score of −1.5.

(A) 40

(B) 63

(C) 79.5

(D) 87 D

The information in the following table shows a student's scores on four exams in a college biology class along with the means and standard deviations of the scores for all the students in the class of 50 students. On which of the exams did the student perform best relative to the performance of the student's classmates?

Exam 1 ; Exam 2 ; Exam 3 ; Exam 4

Student's grade: 75 87 92 70

Class mean: 65 88 86 60

Class standard deviation: 5 2 4 10

(A) Exam 1

(B) Exam 2

(C) Exam 3

(D) Exam 4 A

6.1 8.2 10.5 12.1 17.3

What is the median of the data set whose box plot is shown?

(A) 8.2

(B) 10.1

(C) 10.5

(D) 12.1 C

6.1 8.2 10.5 12.1 17.3

What is the range of the data set whose box plot is shown?

(A) 11.2

(B) 9.1

(C) 6.8

(D) 3.9 A

6.1 8.2 10.5 12.1 17.3

What is the IQR of the data set whose box plot is shown?

(A) 11.2

(B) 9.1

(C) 6.8

(D) 3.9 D

6.1 8.2 10.5 12.1 17.3

(A) There are no outliers in the data.

(B) A value of 17.3 is a possible outlier.

(C) Any value between 6.1 and 8.2 is a possible outlier.

(D) Any value between 12.1 and 17.3 is a possible outlier. A

-10 10

Choose the 5-number summary that best matches the box plot shown.

(A) Min: −11; Q1: −10.2; Med: 0.1; Q3: 7.5; Max: 10.2

(B) Min: −13; Q1: −10.2; Med: 0.1; Q3: 7.5; Max: 10.2

(C) Min: −13; Q1: −10.2; Med: 0.1; Q3: 10.2; Max: 11

(D) Min: −14; Q1: −10.2; Med: 0.1; Q3: 7.5; Max: 11 B

-10 10

What is the approximate IQR of the data set whose box plot is shown?

(A) -2.7

(B) 17.7

(C) 2.7

(D) 23.2 B

Consider the bar graph shown and determine the IQR for the data.

Ratings of a New Product by 48 Customers

on a Scale from 0 (Lowest) to 5 (Highest)

(A) 2

(B) 2.5

(C) 3

(D) 3.5 B

Consider the stem-and-leaf plot shown. Determine the IQR (in pounds) for the data.

Starting Weights in Pounds of 36 Female Students

Participating in a Weight-Loss Program

(A) 19

(B) 20

(C) 21.5

(D) 19.5 D

Number of Minutes 16 Customers

Waited in Line

Determine the IQR (in minutes) for the data.

(A) 5

(B) 8

(C) 9

(D) 14 B

Number of Minutes 16 Customers

Waited in Line

Which of the following statements is always true?

(A) There are no outliers in the data.

(B) A time of 19 minutes is a possible outlier.

(C) A time of 5 minutes is a possible outlier.

(D) Outliers cannot be determined for the dot plot shown. A

Which of the following statements is always true about outliers?

(A) The maximum and minimum values of a data set are outliers.

(B) All outliers are the result of measurement errors.

(C) Outliers signal a concern that should be investigated.

(D) Data values that are more than one IQR below Q1 are outliers. C

What information must be included on a laboratory request form? Source of the microbiologic specimen

The appropriate way to handle and dispose of contaminated sharps is to \_\_\_\_. place used sharps in a rigid, leakproof, puncture-resistant biohazardous waste container

\_\_\_\_ regulates circadian rhythms. melatonin

Which of the following refers to the study of microorganisms? Microbiology

What is the definition of tachypnea? rapid breathing

An infection caused by a parasite is called a(n) \_\_\_\_. infestation

The cranial nerves that carry sensory information from the tongue are the \_\_\_\_. facial nerves

At what age should infants respond to the instruction "No" and quickly turn to the sound of their name? 8 to 12 months of age

Which type of immunoglobulin recognizes bacteria, viruses, and toxins? IgG

Which hormone stimulates the body to retain sodium and water and is important for maintaining blood pressure? aldosterone

Which lobe of the brain interprets auditory stimuli? temporal

Which of the following are characteristics of viruses? They cannot be seen with a regular microscope.

Which of the following is the inner layer of the eye, which contains rods and cones? retina

What is located at the end of the axon branches that allows impulse transmission to continue to other neurons? synaptic knob

Which of the following can cause a motor response without getting information from the brain? reflex

Procedures for packaging and labeling a specimen for mail delivery are set by \_\_\_\_. CDC

Which of the following is considered a physical reaction to a stressor? increased heart rate

Sherry is a 17-year-old patient who arrives at the office complaining of fever, headache, frequent cough, and being tired all the time. She is concerned because her boyfriend has similar symptoms and was recently diagnosed with mononucleosis. Which of the following precautions should you take while you are working with Sherry? Wear a mask while you are in the exam room

The first tapping sound heard when taking a blood pressure is the \_\_\_\_. systolic pressure

Which of the following controls visual reflexes? midbrain

When you ask Mrs. Redding how she would like to pay the $48 she owes for today's services, she hands you a credit card. When you look at the card, you realize that the card expired two months ago. Which of the following would be your best response to Mrs. Redding? "I'm sorry, Mrs. Redding, but this card has expired. Do you have another card we might use?"

Which hormones are made of amino acids and do not cross cell membranes easily? nonsteroidal

When the office manager or practitioner decides that an account is uncollectable, he or she will \_\_\_\_. adjust the amount due off the account

Any factor that causes the formation of cancer is a(n) \_\_\_\_. carcinogen

Which of the following secrete chemicals that produce holes in the membranes of harmful cells but do not have to recognize a specific antigen to start destroying pathogens? natural killer (NK) cells

Which type of check is usually used for payroll in the medical office? limited

Which of the following describes the white matter of the spinal cord? it contains myelinated axons

Which nerves carry sensory information from the thoracic and abdominal organs to the brain? Vagus

When educating a patient on maintaining eye safety in the home, patients should be reminded to \_\_\_\_. never mix cleaning solutions

\_\_\_\_ is an inflammation of the ear. otitis

The appropriate gloves to use when cleaning up a spill in the work environment are \_\_\_\_. Utility gloves

What components of a neuron are usually short and branch profusely near a cell body? dendrites

Which of the following reproduce by budding? yeasts

A non-serious OSHA violation results in a \_\_\_\_. discretionary fine of up to $7,000

Max came home with an itchy red rash. When his mother took him to the pediatrician, she determined that Max had chickenpox. The pediatrician asked if other children at his daycare also have chickenpox, because this is a(n) \_\_\_\_. exogenous infection

A type of check that states it is void after a certain time limit is a \_\_\_\_ check. limited

Clara Simmons, a 62-year-old patient, has come to the medical office with a complaint of weight gain and puffy hands and feet. "This isn't like me," she says. "I exercise regularly and watch my diet." When you check her vital signs, you find that her blood pressure is 84/50, hear heart rate is 56, and her respirations are 12. For which of the following disorders might you expect the physician to test? Myxedema

The \_\_\_\_ is a wedge-shaped thickening in the middle layer of the eyeball that controls the shape of the lens. ciliary body

Which of these become plasma cells in response to an antigen and make antibodies against the specific antigen? B cells

Which type of hormone can cross a cell membrane easily? steroidal

The most appropriate way to determine which parent has consent ability and payment responsibility for a minor child is to \_\_\_\_. ensure that the parent who brings the child for treatment has consent ability and an understanding of the payment responsibility

Which activated T cells increase phagocytosis and antibody formation? helper

Which of the following routine tests are most often performed at the physician's office laboratory (POL)? Chemistry and hematology

Which of the following is a temperature of 98.6ºF converted to Celsius? 37ºC

Which of the following is not required by the OSHA Hazard Communication? Containers used to store nonhazardous waste must be clearly marked

An OSHA violation that was committed intentionally and resulted in a patient's death carries which of the following penalties? Fine of up to $70,000 and/or up to 6 months' imprisonment

Which of the following has membranes that contain large amounts of myelin that insulates the axons and allows them to send nerve impulses quickly? Schwann cells

\_\_\_\_ headaches are generally more severe and intense than other types and are more often experienced by men. cluster

The \_\_\_\_\_\_ are responsible for blinking and squinting. orbicularis oculi

Beneficial bacteria found in the body that perform functions such as producing vitamins are called \_\_\_\_. normal flora

Which of the following is the result of excess growth hormone in children? gigantism

In which disorder do misaligned or unbalanced eye muscles cause the eyes to appear to be looking in two different directions? strabismus

Which of these hormones decreases blood sugar? insulin

Which of these controls blood pressure, as well as coughing and sneezing reflexes? medulla oblongata

Which of the following describes the gray matter of the spinal cord? It contains neuron cell bodies

The \_\_\_\_ maintains equal pressure on both sides of the eardrum. Eustachian tube

Which of the following results occurs in response to an infection? Inflammation

Mrs. Young called the medical office because her 6-year-old daughter Mary says she feels ill. Mrs. Young used a disposable thermometer to measure the child's temperature and found it to be 102.3° Fahrenheit. Which of the following would be the best response to Mrs. Young? Make an appointment for Mary this afternoon, and ask Mrs. Young to use a regular oral thermometer to check the temperature again

The \_\_\_\_ gland secretes the hormone calcitonin. thyroid

Allergies can be treated effectively by which of the following over-the-counter medications? antihistamines

Which of the following secrete lymphokines? T cells

Determination of the number of bacteria present in specimens is called \_\_\_\_. quantitative analysis

Which type of headache causes soreness in the temples and can occur daily for weeks? tension

The hard protein the body produces that makes visualizing the fungus possible only in a KOH mount is called \_\_\_\_. keratin

Which of the following information should be included on a statement? The balance from the previous month and an itemized list of charges

Which type of immunity results from a vaccine? artificially acquired active

A medical assistant can help break the cycle of infection in the office by \_\_\_\_. maintaining strict housekeeping standards

The \_\_\_\_ nerves carry information about odors to the brain. Olfactory

Which of the following are usually components of a practice's accounting system? Daily log and disbursements journal

Which of the following is not a common type of endorsement? Mechanical endorsement

Payment by credit card for a medical practice \_\_\_\_. provides prompt payment from the credit card company

A buildup of earwax within the external auditory canal is \_\_\_\_. cerumen impaction

Which of the following requires credit bureaus to supply correct and complete information to businesses for use in evaluating a person's application for credit, insurance, or a job? Fair Credit Reporting Act

Which of the following is part of the procedure for measuring the weight of an adult? Placing a disposable towel on the scale

Which of these assessments would help to identify an endocrine problem in a child? Tracking the child's development on a standard growth chart

\_\_\_\_ is a degenerative disease of the brain. Alzheimer's disease

Which immunoglobulin is thought to control the activity of B cells? IgD

The organism pictured here spreads bacteria that causes Lyme disease and is considered a \_\_\_\_. parasitic insect

Which of the following describes the thymus? It decreases in size as a person ages

Antidiuretic hormone and oxytocin are released by the \_\_\_\_. posterior pituitary gland

Which condition is generally caused when brain cells die because of an inadequate blood flow? stroke

A practitioner may use a \_\_\_\_ check when he wants to withdraw money from the bank account but forgot his checkbook. counter

Which type of immunity results from exposure to an antigen? naturally acquired active

Mucous membranes and skin are examples of which type of nonspecific body defense? mechanical barriers

An account that is open to charges made occasionally as needed is called a(n) \_\_\_\_. open book account

When is it appropriate for a medical provider to assess finance charges or late charges on past-due accounts? Only when the patient is notified in advance

An inflammation of the track in the eye that includes the iris, ciliary body, and choroid is called \_\_\_\_\_\_\_\_. uveitis

The hormone \_\_\_\_ lowers blood calcium by activating osteoblasts, which use excess blood calcium to build new bone tissue. calcitonin

Elisa has just been diagnosed with stage II breast cancer. The practitioner has explained what this means, but Elisa is upset and confused. She asks the medical assistant if her cancer is serious. Which of the following is the best response to her question? "All cancers are potentially serious, but your cancer has not spread beyond the breast."

Which of the following is a type of sensorineural hearing loss and the most common form of hearing loss in older adults? presbycusis

The middle layer of the meninges, named for its spider web-like appearance, is the \_\_\_\_. arachnoid mater

When a hazard occurs that is not addressed specifically by an OSHA standard, \_\_\_\_. the general duty clause takes effect

Interferon in the blood acts as which type of nonspecific body defense? chemical barrier

Which of the following support and position the specimen and prevent contamination of the microscope by the specimen? coverslip and slide

Which of the following microorganisms cause diseases that are a leading cause of death in developing countries because of lack of proper sanitation? protozoans

The nonspecific body defense in which neutrophils and monocytes can leave the bloodstream to attack pathogens in other tissues is \_\_\_\_. phagocytosis

A patient just had a drink of cold water and you are getting ready to perform the vital signs and measurements. Which would be the best order? BP, P, R, Ht., Wt., T

An appropriate way to handle a patient relocation and address change is to \_\_\_\_. ask a third party for the patient's new address

Which of these produce tears and secrete enzymes to destroy bacteria and viruses in the eye? lacrimal glands

Which disorder occurs when the body's immune system attacks the peripheral nervous system? Guillain-Barré syndrome

Determination of the type of pathogen is called \_\_\_\_. qualitative analysis

The \_\_\_\_ is between the arachnoid mater and pia mater and contains cerebrospinal fluid. subarachnoid space

Which of these electrolytes plays an important role in the generation of nerve impulses? Potassium

Which of the following stimulates red blood cell production? erythropoietin

Mrs. Whitley, a 61-year-old patient, calls the office this morning. She says she is afraid to drive to the office, because when she woke up this morning, her vision was "funny, like everything is wavering in front of my eyes." She is also seeing flashes of light and floaters. Which of the following statements is your best response to Mrs. Whitley? "Mrs. Whitley, please have someone drive you to the hospital immediately, or call 911."

Which disorder is an immune reaction linked to eating gluten that triggers a reaction causing the body to attack the small intestinal mucosa? celiac

Which of the following defines hearing loss? loss of the ability to hear sounds at normal levels

Jim Sanderson comes to the office today to pay the balance due on his statement. He presents the statement, showing an amount due of $96.75, and a money order for $96.75. How should this payment be handled? Accept the money order and record it on the daily log and the patient's ledger card

Which of the following is the result of an excess in growth hormone in adults? acromegaly

A microorganism capable of causing disease is a \_\_\_\_. pathogen

A high glucose level due to the inadequate secretion of insulin is \_\_\_\_. diabetes mellitus

Which of the following statements about conjunctivitis is not true? It is a condition in which fluid pressure builds up inside the eye.

A quality assurance program \_\_\_\_. is designed to monitor the quality of patient care a medical laboratory provides

An endorsement that specifies precisely how the check may be redeemed, such as only for deposit in the practice's bank account, is a \_\_\_\_. restrictive endorsement

If lymph cannot be pushed through the vessels, \_\_\_\_. edema develops

Which of these is located behind the pons and medulla oblongata? cerebellum

Which of the following states that creditors may not discriminate against an applicant because he or she receives public assistance? Equal Credit Opportunity Act

Mr. Pierce arrived for his scheduled blood test at 10:00 this morning. When you asked if he followed instructions and fasted since midnight, he proudly states that he hasn't had anything "except my morning coffee." What should you do? Inform the physician to determine whether the blood can still be collected

A characteristic of a mutual agreement is that \_\_\_\_. the physician and the patient agree on how much each month's payment will be

Adrian is a patient whose parents were killed in a skiing accident a few months ago. Adrian was involved in an automobile accident this morning. He refused ambulance transport and a friend brought him to your office because he needed only minor wound care. He turned 21 last week, so he is legally an adult. He tells you he has no insurance and doesn't know how he will pay for his care. Adrian might be a candidate for \_\_\_\_. a hardship case

Which of the following is important when measuring an oral temperature? The patient must be able to breathe through the nose

The \_\_\_\_ nerves act in the muscles that move the eyeball. Trochlear

Which of the following is a diplomatic way to ask a patient for payment? "For today's visit, the total charge is $74. How would you like to pay?"

Masses of lymphoid tissue not surrounded by a capsule that are distributed in the connective tissue of mucosa are known as \_\_\_\_\_\_\_. lymph nodules

Which of the following accounts payable is typically the largest in a medical office? payroll

Which of the following actions causes lymph to flow through the lymphatic vessels? The squeezing action of the skeletal muscles

All biohazardous waste containers must have which type of label attached. orange-red

Which type of immunity results simply from being human, as opposed to being a cow or plant? species resistance

Which of the following is the normal range for respirations per minute in an infant? 30-60

Which of these is hearing loss due to the aging process? presbycusis

Which of the following causes a rapid drop in blood pressure and is a life-threatening event? anaphylaxis

In which of the following conditions is too much cortisol produced? Cushing's syndrome

Which of the following is true regarding anaerobes? They grow best in the absence of oxygen

Which hormone increases blood sugar? glucagon

Which of the following describes the parasympathetic division of the autonomic nervous system? it releases acetylcholine

When a person develops antibodies that attack the thyroid gland, causing the thyroid to produce too many thyroid hormones, that person has \_\_\_\_. Graves' disease

Which classification of microorganisms contains protozoans, fungi, and parasites? Eukaryotic

Which of the following are the membranes that protect the brain and spinal cord? meninges

Which of the following does not describe a secondary immune response? It causes memory cells to develop

The \_\_\_\_ is a transparent area on the front of the eye that allows light to enter the eye. cornea

What type of nerves carry sensory information from the throat and tongue to the brain for interpretation? Glossopharyngeal

There are six \_\_\_\_ that function together to move the eyeball. extrinsic eye muscles

Which type of test can be used to diagnose Alzheimer's and Parkinson's diseases? PET scan

Creutzfeldt-Jakob disease (CJD) and Bovine spongiform encephalopathy (BSE) are caused by a(n) \_\_\_\_. prion

Which lobe of the brain interprets sensations felt in or on the body? parietal

Fungi that grow into large, fuzzy, multicelled organisms that produce spores are called \_\_\_\_. molds

The medical provider has explained to Cherise that she has an abscess in her spleen and the spleen will need to be removed. When the medical assistant who is educating Cherise on the procedure asks if she has any questions, she asks if the spleen removal will cause a health problem. What is the best response to her question? "The liver will take over most of the spleen's functions."

The spiral-shaped bacterium pictured here is classified as a \_\_\_\_. spirillum

The \_\_\_\_ causes muscles to contract or relax and glands to secrete products. neurotransmitter

Which ear disorder is the result of injury from a sharp object, an explosion, a sudden change in air pressure, or severe middle ear infection? ruptured eardrum

In what year was the Needlestick Safety and Prevention Act signed into law? 2000

What is the innermost delicate layer of the meninges, which sits directly on top of the brain and spinal cord and holds blood vessels onto the surface of these structures? pia mater

The \_\_\_\_ releases thymosin, which promotes the production of T cells. thymus

Which of the following cells mainly target cancer cells? natural killer (NK) cells

The diagnostic test that detects electrical activity in the brain is a(n) \_\_\_\_ electroencephalography

An example of a subcellular microorganism is a \_\_\_. virus

Which of the following diagnostic tests is useful in detecting aneurysms in the brain? cerebral angiography

Which of the following is important when measuring an axillary temperature? Place the shaft of the thermometer facing forward

A(n) \_\_\_\_ is an automatic response to a stimulus. reflex

Which of the following allows the eye to focus on images? lens

Which of the following are only found in the central nervous system and act as interpreters between the afferent and efferent nerves? interneurons

Vanessa has just been diagnosed with Guillain-Barré syndrome. She is very worried because she has heard terrible things about this syndrome. "I don't want to die!" she says. Which of the following would be the best response to give her? "With proper medical treatment, this disease is not fatal; you may recover completely."

Which type of activated T cells prevents a person from having the same disease twice? memory

Which of the following occurs when parts of the brain receive a burst of electrical signals that disrupt normal brain activity? epilepsy

The comma-shaped bacteria pictured here are \_\_\_\_. vibrios

Which of the following is a guideline for the preparation and transportation of a specimen to an outside laboratory for pathologic study? Maintain the sample in a state as close to its original state as possible

The hormone that stimulates production of T lymphocytes is \_\_\_\_. thymosin

Which of the following is not an advantage of using a computerized bookkeeping system? The bookkeeping system is available even if the power goes out.

What are the "bumps" of brain matter between the sulci are called Gyri

The toughest and outermost layer of the meninges is the \_\_\_\_. dura mater

The \_\_\_\_ secretes a hormone called erythropoietin, which stimulates blood cell production. kidney

Marc is in the office today because his face has felt "numb" for the last 24 hours. He also has a headache, and he says his eyes have been "watering." Which of the following diagnoses would the practitioner be likely to make, considering these symptoms? Bell's palsy

Bacteria are most commonly classified according to their \_\_\_\_. shape

Which of the following should be included when obtaining a throat culture specimen from a patient? Wear examination gloves, goggles, and a mask or face shield

Which of the following statements is true about electronic banking? The computer computes the new balance each time you record a check.

Which of the following is used to measure the large amounts of liquids necessary for reagents? volumetric beaker

How is a congenital infection contracted? present at the time of birth

Which of the following is a frequent cause of bacterial infections, including epiglottitis and pneumonia, in infants and young children in the United States? Haemophilus influenzae serotype b

Which of the following are signs or symptoms of chronic fatigue syndrome? tender lymph nodes and joint pain

Which of the following is used to test color vision? Ishihara book

Which of the following describes the sympathetic division of the autonomic nervous system? it secretes norepinephrine

The normal adult range for respirations per minute is \_\_\_\_. 12-18

Which of the following pulse points is located in the groove on the thumb side of the inner wrist? radial

Workforce drug testing is a type of \_\_\_\_\_\_ test. toxicology

Which of the following structures is on the medial aspect of each eye and drains tears into the nose? nasolacrimal ducts

A foreign object that is visible through a microscope, but is unrelated to the specimen and may be misinterpreted when the specimen is examined, is a(n) \_\_\_\_. artifact

Which of the following activated T cells is active against viruses and protects the body against cancer? cytotoxic

If a medical practice accepts credit card payments, the American Medical Association (AMA) suggests the use of which guideline? Do not encourage patients to use credit cards for payment.

A letter that has a friendly, "we want to help" tone and gives the patient options but makes it clear that the patient must take some sort of action, is most appropriately sent when the account is \_\_\_\_ days past due. 60

A device for spinning a specimen at high speed until it separates into its component parts is a \_\_\_\_. centrifuge

When you place a patient's ledger card on the pegboard, how should you position the card? Align the ledger card's first blank line with the carbon strip under the next available superbill

Which of these is the tough, outermost layer of the eye, also called the "white of the eye"? sclera

Mrs. Tanneman has brought her husband to your office because she says "he just doesn't seem to understand anything anymore." She says he often just sits on the couch for hours staring into space and does not respond when she speaks to him. When he does respond to her questions, sometimes his answers don't have anything to do with the question she asked. Which of the following neurological tests would provide the most helpful information about Mr. Tanneman's health? PET scan

According to OSHA, Category I tasks expose a worker to blood, body fluids, or tissues.

A standard personal or business check that the bank verifies and then sets aside the funds to guarantee payment is which type of check? Certified

A double-entry bookkeeping system is based on the principle that the company's assets are equal to \_\_\_\_. capital plus its liabilities

Which of the following identifies how far cancer cells have spread? staging

Which of these is in the posterior chamber of the eye? vitreous humor

The function of \_\_\_\_\_ is to send information or nerve impulses away from the cell body? axons

Which of these cranial nerves carry sensory information from the skin of the scalp and face? trigeminal nerves

Which of the following are mucous membranes that line the inner surfaces of the eyelids? Conjunctivas

Which of the following bind to antigens on cells and attack them directly? T cells

Trinity is a 9-year-old patient who has a fever, swollen glands, and a red rash. Upon examination, the physician found the organism shown in the picture. Which of the following diseases might the physician suspect based on this evidence? Lyme disease

The gustatory cortex located in the \_\_\_\_\_\_ interprets taste sensations. brain

Which cranial nerves innervate the muscles of the tongue? hypoglossal nerves

Which gland or organ secretes epinephrine and aldosterone? adrenal

Illustrations containing numbers or symbols made up of colored dots that appear among other colored dots are used to test for \_\_\_\_. color blindness

Which type of bacteria causes boils, acne, abscesses, food poisoning, and a type of pneumonia? Staphylococci

Which of the following is an inflammation of the heart tissue that occurs most frequently in school-age children as a result of an untreated strep throat? rheumatic fever

Which of the following releases melatonin, which regulates a person's biological clock? pineal body

At which vertebral level does the spinal cord end? first lumbar vertebra

If an account is \_\_\_\_ days past due, send a letter explaining that unless you hear from the patient by a specific date, the account will be given to a specific collection agency for collection. 120

If a practitioner decides not to extend credit to a patient, what must be done according to the Fair Credit Reporting Act? Inform the patient in writing why credit was denied

Which immunoglobulin triggers an allergic reaction? IgE

Which type of immunity results from having an infectious disease? naturally acquired active

\_\_\_\_ is a condition in which too little growth hormone is produced in childhood. dwarfism

Chessie will have surgery next week to have her pituitary gland removed. She asks what effects this might have on her overall health. Which of the following conditions could she experience after this type of surgery? Hypothyroidism

Which of the following is characteristic of a subcellular microorganism? Noncellular structure in which the nucleic acid is surrounded by a protein coat

Aseptic hand washing includes \_\_\_\_. keeping your hands lower than your forearms

Also known as Lou Gehrig's disease, \_\_\_\_ is a degenerative disease of the spinal cord and brain. amyotrophic lateral sclerosis

A sample of a specimen that is placed in or on a substance that allows microorganisms to grow is a \_\_\_\_. culture

What type of infection is caused by a microorganism that is normally beneficial or harmless to humans? endogenous infection

Which of the following is an organism that lives on or in another organism and uses that other organism for its nourishment, or for some other advantage, to the detriment of the host organism? parasite

Anything that inflames the CNS will cause \_\_\_\_. the blood-brain barrier to become more permeable

In which way does an individual develop a naturally acquired active immunity? From exposure to organisms that cause a disease

Which of the following is a guideline for making a call requesting payment from a patient? Call the patient after 8 a.m. or before 9 p.m.

Which of the following involves culturing a specimen and then testing the isolated bacterium's susceptibility to antibiotics? culture and sensitivity

Which hormone increases energy production by cells, stimulates protein synthesis, and speeds up the repair of damaged tissues? thyroid hormones

In which nonspecific body defense do blood vessels dilate, bringing more blood to the area, which in turn brings phagocytic white blood cells to the area to attack the pathogen, proteins to replace injured tissues, and clotting factors to stop any bleeding? inflammation

A medical provider or practice manager may periodically review which of the following reports to ensure accuracy of the books? Trial balance

Janyce is a 19-year-old patient who came to the medical office because she is having trouble with her eyes. They move rapidly side-to-side, and she can't seem to control it. She says it's embarrassing, because her friends are uncomfortable around her and do not want to look at her directly. She denies drug use, but does drink "a lot" of alcohol. She has not had any injuries to the head. Testing rules out a stroke or lesion on the brain. Which of the following would you expect the physician to suggest to treat her nystagmus? Alcohol rehabilitation therapy

Which of these antibodies is found in secretions of the body and prevents pathogens from entering the body? IgA

Which parts of the eye are highly sensitive to light and function best in dim light but do not provide a sharp image and detect only black, white, and shades of gray? rods

Which of the following hormones decreases protein synthesis and inflammation? cortisol

A common cause of conductive hearing loss is the immobilization of the stapes within the inner ear, called \_\_\_\_. otosclerosis

Which of the following is characteristic of resident normal flora? they are normally found on the skin and within the human body

Which of the following protects telephone subscribers from unwanted telephone solicitations? Telephone Consumer Protection Act

When spicy foods are eaten, which receptors on the tongue are activated? pain

Which of the following types of immunity crosses the placenta and passes through the breast milk? naturally acquired passive

Which lobe of the brain controls motor activity? frontal

Which of the following is an accurate statement about open-book accounts? The last date of payment or charge for each illness is used as the starting date for determining the time limit on that specific debt.

The hormone atrial natriuretic peptide is released by which organ? heart

Which of the following produce memory cells that trigger a strong response to future exposures to the same antigen? T cells

Three-year-old Tyler's parents report that he has had a runny nose and a mild cough for the last several days. They brought him to the clinic because the coughing has become "terrible" during the past 24 hours. While getting the history from the parents, you notice a "whoop" sound as Tyler inhales after a severe coughing spell. Which of the following diseases is the most probable cause of Tyler's cough? pertussis

An acute, often fatal, infectious bacterial disease caused by the introduction of pathogenic spores, which enter the body through a contaminated puncture wound, is\_\_\_\_. tetanus

The process of comparing the office financial records with the monthly statement from the bank is known as \_\_\_\_. reconciliation

Also known as Lou Gehrig's disease, \_\_\_\_ is a degenerative disease of the spinal cord and brain. amyotrophic lateral sclerosis

The \_\_\_\_ gland releases PTH. parathyroid

Which of the following is the function of the focus controls? they bring the objects being examined into clear view

The viral infection that affects the salivary glands, causing fever, headache, and inflammation of the glands is \_\_\_\_. mumps

Factors related to the host's susceptibility to infection are \_\_\_\_. age and nutritional status

Which gland or organ releases luteinizing hormone? anterior pituitary

Which of the following would you include when performing a Gram stain? Cover the entire specimen area with iodine and allow it to remain for 1 minute

Which of the following is considered a normal blood pressure for a healthy adult? less than 120/less than 80

Most of a practitioner's long-standing patients have which type of account? Open-book account

Which of the following can be caused by a bacterial or viral infection? conjunctivitis

Respiratory diseases such as tuberculosis are often transmitted by \_\_\_\_. airborne transmission

The three tiny bones that vibrate in response to sound are called \_\_\_\_\_\_. ear ossicles

Hand sanitizer rubs have up to \_\_\_\_\_\_\_\_% alcohol content. 95

Which of the following local hormones that typically are produced close to their target cells are produced by many body organs? prostaglandins

Which hormone, released by the heart, regulates blood pressure? atrial natriuretic peptide

The part of the accounting process that consists of the systematic recording of business transactions is \_\_\_\_. bookkeeping

If your medical practice does not have an authorization device for credit card payment, \_\_\_\_. call the credit card company for authorization

Which of the following can either stimulate neurons to send a nerve impulse or inhibit them from sending an impulse? neurotransmitter

Which of the following is an example of direct transmission of a pathogen? Contact with the blood of an infected person

When a person develops food poisoning after eating at a restaurant salad bar, the most likely form of transmission is \_\_\_\_. foodborne

The \_\_\_\_ of the spinal cord carries motor information from the brain to the muscles and glands. descending track

Which of the following is unique to an individual, is present on every cell in that person's body, and activates T cells? major histocompatibility complex (MHC)

Which of the following types of bacteria are responsible for infections such as syphilis and Lyme disease? spirilla

Which of the following, found in insects such as ticks and mites, are responsible for diseases such as Rocky Mountain spotted fever and typhus? Rickettsiae

The \_\_\_\_ controls the amount of light entering the eye. iris

Which of the following connects the cerebrum to the spinal cord? brainstem

Moderate-complexity tests include \_\_\_\_. chemistry, immunology, bacteriology, and virology

Which of the following should you include when preparing a KOH mount? Suspend the specimen in a drop of 10% potassium hydroxide

Which of these is used to rescue a person experiencing anaphylaxis? epinephrine

Which of the following bacteria grow in grape-like clusters and are commonly found on the skin? staphylococci

Which of the following are characteristics of prokaryotic cells? They are simply structured with a single chromosome and no organelles.

Which of the following is an excessive immune response that involves IgE antibodies? allergy

Which of the following are the grooves on the surface of the cerebrum? sulci

Rick, a 22-year-old patient, has had a bad cough that has lasted almost a month. He says his chest hurts, and he has been coughing up blood. Since his last visit three months ago, he has lost 12 pounds. His temperature is 101.9°F. For which of the following diseases might you expect the physician to test? tuberculosis

Today, a practice's financial summary is generally prepared by \_\_\_\_. practice management software

The \_\_\_\_ is the area between the semicircular canals and the cochlea that helps detect balance of the body. vestibule

Which type of immunity requires injection with an antibody? artificially acquired passive

Which of the following is the most accurate measurement of body temperature? rectal temperature

Which of the following are not signs or symptoms of systemic lupus erythematosus? Tender lymph nodes in the neck

Respiration is the number of times a patient breathes in \_\_\_\_ seconds. 60

What is the shape of streptococci bacteria? Cocci

1. Which of the following illustrates quantitative data?

(A) foremost colors (red, yellow, orange, or other colors) of flowers in a garden.

(B) sex (male or female) of users of a website

(C) lengths (in meters) of broad jumps

(D) satisfaction ratings (on a scale from "not satisfied" to "very satisfied") by users of a website C

2. Which of the following illustrates quantitative data?

(A) ten-digit US social security numbers of students in a classroom

(B) college classifications (freshman, sophomore, junior, senior)

(C) flavors of ice cream

(D) weights (in pounds) of newborns at a regional hospital D

3. Which of the following does NOT illustrate quantitative data?

(A) freezing temperatures (on a Celsius scale) of chemical mixtures

(B) heights (in centimeters) of plants

(C) survey responses (on a scale from "strongly disagree" to "strongly agree") of likely voters

(D) number (0, 1, 2, or a greater integer) of people attending a

conference C

4. Which of the following illustrates qualitative data?

(A) eye colors (blue, brown, green, hazel) of babies

(B) distances (in miles) traveled by students commuting to school

(C) heights (in inches) of students in a classroom

(D) number (0, 1, 2, or a greater integer) of students absent from school A

5. Which of the following illustrates qualitative data?

(A) number (0, 1, 2, or a greater integer) in favor of school uniforms

(B) names (first and last names) of students who took an exam

(C) ages (in months) of a class of preschool children

(D) costs (in dollars and cents) of tuition at four-year universities in a particular state B

6. Which of the following does NOT illustrate qualitative data?

(A) ten-digit US social security numbers of students in a classroom

(B) numbers on football jerseys

(C) heights (in centimeters) of plants

(D) customer ratings (on a scale from "very unpleasant" to "very pleasant") of an online-purchase experience C

7. Eye colors (blue, brown, green, hazel) of babies

(A) nominal

(B) ordinal

(C) interval

(D) ratio A

8. Distances (in miles) traveled by students commuting to school

(A) nominal

(B) ordinal

(C) interval

(D) ratio D

9. Number (0, 1, 2, or a greater integer) of students in a classroom

(A) nominal

(B) ordinal

(C) interval

(D) ratio D

10. Survey responses (on a scale from "strongly disagree" to "strongly agree") of likely voters

(A) nominal

(B) ordinal

(C) interval

(D) ratio B

11. Which of the following levels of measurement generally is/are considered qualitative data?

I. nominal

II. ordinal

III. interval

IV. ratio

(A) I only

(B) I and II only

(C) III only

(D) III and IV only B

12. Which of the following levels of measurement generally is/are considered quantitative data?

I. nominal

II. ordinal

III. interval

IV. ratio

(A) I only

(B) I and II only

(C) III only

(D) III and IV only D

13. Which of the following illustrates discrete data?

(A) number of brown-eyed children in a classroom

(B) distances (in miles) traveled by students commuting to school

(C) heights (in inches) of students in a classroom

(D) survey responses (on a scale from "strongly disagree" to "strongly agree") of likely voters A

14. Which of the following illustrates discrete data?

(A) number (0, 1, 2, or a greater integer) in favor of school uniforms

(B) initial weights (in pounds) of participants in a weight-loss program

(C) ages (in months) of a class of preschool children

(D) weights (in ounces) of boxes of cereal A

15. Which of the following illustrates continuous data?

(A) number of students in a classroom

(B) number of patients who improved after receiving an experimental drug

(C) heights (in centimeters) of plants

(D) number of customers who rated an online-purchasing experience as "very pleasant" C

16. Which of the following illustrates continuous data?

(A) ten-digit US social security numbers of students in a classroom

(B) number of female users of a website

(C) lengths (in meters) of broad jumps

(D) satisfaction ratings (on a scale from "not satisfied" to "very satisfied") by users of a website C

17. The table shown displays the results of a poll that asked 240 college students to identify their favorite movie genre. If a circle graph is constructed using the data in the table, what central angle should be used to represent the category comedy/romantic comedy?

Movie Genre Preference

Genre Number of Students

Action/adventure 33

Drama 16

Comedy/romantic comedy 76

Musical 11

Mystery/crime 12

Horror/suspense/occult 48

Science fiction/fantasy 35

Other 9

Total 240

(A) 32°

(B) 76°

(C) 114°

(D) 246° C

18. The circle graph shown displays a budget for a monthly income of $3,500 (after taxes). According to the graph, how much more money is budgeted for rent than for food and clothing combined?

Rent (40%) , Food (17%), Clothing (17%)

(A) $210

(B) $595

(C) $1,190

(D) $1,400 A

19. According to the pictograph shown, how many of the 40 cat owners surveyed responded "yes" to the question "Do you own a dog?"

Responses of 40 Cat Owners to the Question "Do You Own a Dog?"

Yes: 12

No: 28

(A) 6

(B) 12

(C) 14

(D) 28 B

20. Consider the following bar graph. Exactly how many students passed the chemistry course (that is, achieved a grade of D or better)?