

Choose the *best* answer.

Use the following information for #1-5.

Let $U = \{q, r, s, t, u, v, w, x, y, z\}$

$A = \{q, s, u, w, y\}$

$B = \{q, s, y, z\}$

$C = \{v, w, x, y, z\}$. List the elements in the set.

1) $(A \cup C)'$

a) $\{r, t\}$ b) $\{q, s, u, v, w, x, y, z\}$ c) $\{q, s, y, z\}$ d) $\{r, t, x\}$

2) $A \cup B'$

a) $\{z\}$ b) $\{q, r, s, t, u, v, w, x, y\}$ c) $\{q, s, u, w, y, z\}$ d) $\{r, t, u, v, w, x\}$

3) $C' \cap B'$

a) $\{r, t\}$ b) $\{q, r, s, t, u, v, w, x\}$ c) $\{r, t, u\}$ d) $\{r, t, x\}$

Use the formula for the cardinal number of the union of two sets to solve the problem.

4) Set A contains 8 elements, set B contains 16 elements, and 6 elements are common to sets A and B. How many elements are in $A \cup B$?

a) 24 b) 18 c) 30 d) 16

Use a Venn diagram to answer the question. (a. Draw the Venn diagram b. answer the question)

5) At East Zone University (EZU) there are 800 students taking College math classes. 321 are taking College Algebra, 514 are taking Calculus, and 84 are taking both College Algebra and Calculus. How many are taking Algebra but not Calculus?

a) 321 b) 430 c) 237 d) 49

Find the cardinal number for the set.

6) Determine the cardinal number of the set $\{x \mid x \text{ is a month of the year}\}$

a) 1 b) 52 c) 365 d) 12

7) License plates in a particular state display 2 letters followed by 2 numbers. How many different license plates can be manufactured? (Repetitions are allowed.)

- a) 10,000 b) 456,976 c) 67,600 d) 54,756

8) There are 4 performers who are to present their acts at a variety show. How many different ways are there to schedule their appearances?

- a) 4 b) 24 c) 12 d) 1

9) A church has 8 bells in its bell tower. Before each church service 5 bells are rung in sequence. No bell is rung more than once. How many sequences are there?

- a) 56 b) 6270 c) 40 d) 6720

10) Amy, Jean, Keith, Tom, Pete, Susan, and Dave have all been invited to a birthday party. They arrive randomly and each person arrives at a different time. (a) In how many ways can they arrive? (b) In how many ways can Jean arrive first and Keith last? (c) Find the probability that Jean will arrive first and Keith will arrive last.

- a) $42, 7, \frac{1}{6}$ b) $5000, 100, \frac{1}{50}$ c) $50, 10, \frac{1}{5}$ d) $5040, 120, \frac{1}{42}$

11) In a class of 50 students, 23 are Democrats, 13 are business majors, and 7 of the business majors are Democrats. If one student is randomly selected from the class, find the probability of choosing a Democrat or a business major.

- a) $\frac{18}{25}$ b) $\frac{43}{50}$ c) $\frac{29}{50}$ d) $\frac{14}{25}$

12) An architect is considering bidding for the design of a new shopping mall. The cost of drawing plans and submitting a model is \$10,000. The probability of being awarded the bid is 0.05, and anticipated profits are \$100,000, resulting in a possible gain of this amount minus the \$10,000 cost for plans and a model. What is the expected value in this situation?

- a) \$5,000 b) -\$5,000 c) \$85,000 d) -\$4,500

- 13) A local support group has 1050 members. A study of 372 people with anxiety disorders, and 75% of them reported a link between energy drinks and the inability to focus. Which statement is true?
- a) The population is 1050, the sample is 372, and 75% is a statistic.
 - b) The population is 1050, the sample is 372, and 75% is a parameter.
 - c) The population is 372, the sample is 1050, and 75% is a statistic.
 - d) The population is 372, the sample is 1050, and 75% is a parameter.

Determine whether the data are qualitative or quantitative.

- 14) the colors of automobiles on a used car lot
A) quantitative B) qualitative
- 15) the number of complaint letters received by the United States Postal Service in a given day
A) qualitative B) quantitative

Identify the data set's level of measurement.

- 16) ages of students in a statistic class
A) ratio B) nominal C) ordinal D) interval
- 17) temperatures of 22 selected refrigerators
A) interval B) nominal C) ordinal D) ratio
- 18) marriage status (married, single, or divorced) of the faculty at the University of Colorado
A) nominal B) ordinal C) ratio D) interval

Identify the sampling technique used.

- 19) Every fifth person boarding a plane is searched thoroughly.
A) systematic
B) cluster
C) convenience
D) random
- 20) A researcher for an airline interviews all of the passengers on five randomly selected flights.
A) systematic
B) cluster
C) random
D) convenience

21) A community college student interviews everyone in a statistics class to determine the percentage of students that own a car.

- A) systematic
- B) cluster
- C) convenience
- D) random

Decide which method of data collection you would use to collect data for the study

22) A study where the effects of a plague hitting Los Angeles is observed

- A) simulation
- B) observational study
- C) experiment
- D) survey

Decide which type of experimental design is evident in the experiment described.

23) An experiment is conducted to see whether the reflex response time of men is increased with a new nutritional supplement . 40 men participate in the experiment, and each man is partnered with another subject who has the most similar response time. One man from each pair will take the new nutritional supplement, and the other man will receive a placebo as a control.

- A) completely randomized design
- B) randomized block design
- C) stratified random sample
- D) matched pairs design

24) A candy company is changing its formula for its most popular chocolate bar. Before committing to the new candy, the company decides to do an experiment to see which formula is preferred by customers. 40 subjects are randomly chosen to try both candy bars, and then to choose which formula they prefer. The conductors of the experiment know which formula the subjects will receive (the order of the treatments given is randomly chosen). Which of the following is a true statement?

- a) A placebo is used.
- b) The experiment is blind.
- c) The experiment is double-blind.
- d) None of these statements is true.

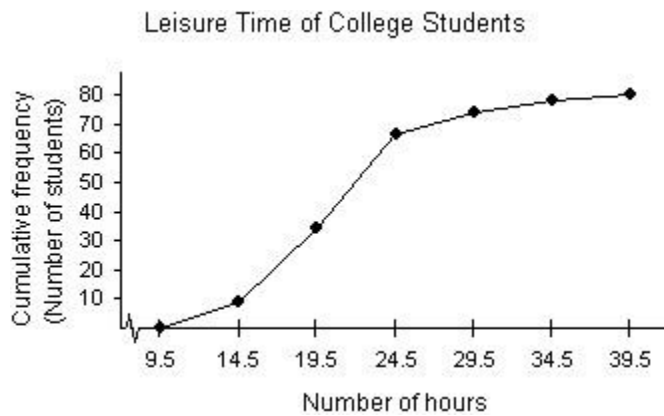
25) There are 4750 students who are currently enrolled at your school. You wish to form a sample of 9 students to answer some survey questions. Select the first three students who will belong to the survey.

31524 49587 76612 39789 13537 48086 59483 60680

- a) 315, 244, 958
- b) 31, 52, 44
- c) 3152, 4495, 8776
- d) 3152, 4495, 1353

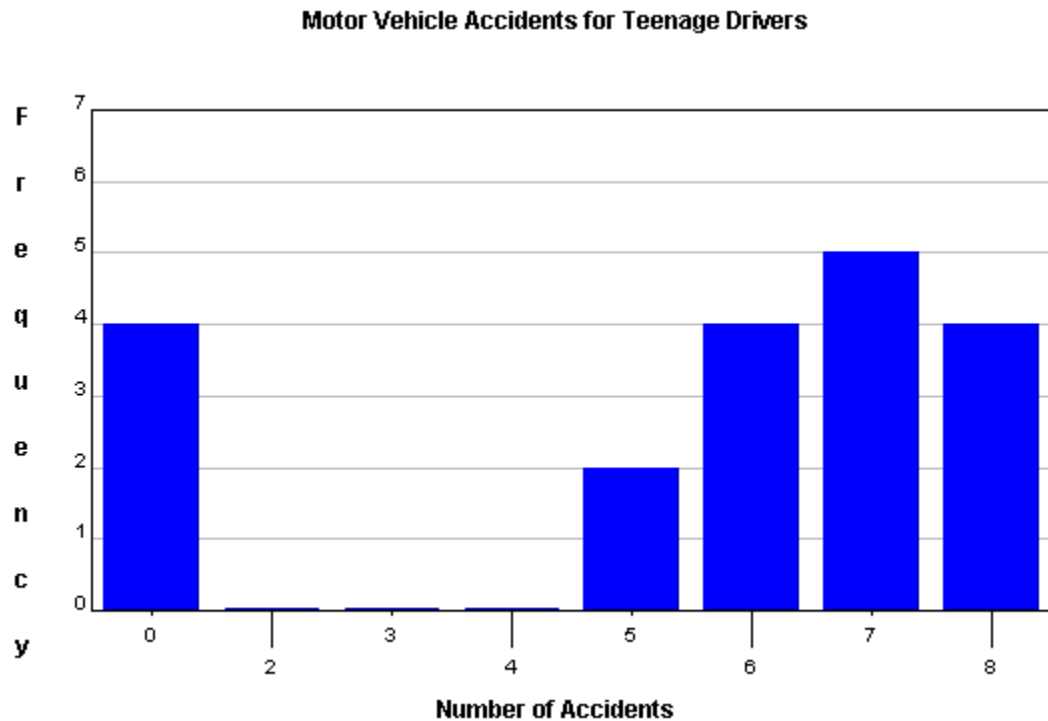
Provide an appropriate response.

29) Use the ogive below to approximate the cumulative frequency for 24 hours.



- a) 17 b) 63 c) 27 d) 80

Use the diagram below for questions 33-36.



30) What is the median for the above diagram?

- a) 2 b) 4.5 c) 6 d) 7.5

37) Determine the probability distribution's missing value.

The probability that a tutor will see 0, 1, 2, 3, or 4 students

x	0	1	2	3	4
P(x)	$\frac{4}{27}$	$\frac{1}{27}$	$\frac{5}{9}$	?	$\frac{5}{27}$

a) $\frac{12}{27}$

b) $\frac{4}{9}$

c) $\frac{2}{27}$

d) $\frac{7}{27}$

38) The random variable x represents the number of boys in a family of three children.

Assuming that boys and girls are equally likely, find the mean and standard deviation for the random variable x.

a) $\mu = 1.5, \sigma = 0.75$

b) $\mu = 2, \sigma = 0.75$

c) $\mu = 2, \sigma = 0.87$

d) $\mu = 1.5, \sigma = 0.87$

39) The random variable x represents the number of credit cards that adults have along with the corresponding probabilities. Find the mean and standard deviation.

x	P(x)
0	0.07
1	0.68
2	0.21
3	0.03
4	0.01

a) $\mu = 1.23, \sigma = 0.66$

b) $\mu = 1.23, \sigma = 1.95$

c) $\mu = 1.95, \sigma = 0.66$

d) $\mu = 1.95, \sigma = 1.23$

40) A test consists of 330 true or false questions. If the student guesses on each question, what is the mean number of correct answers?

a) 150

b) 160

c) 155

d) 165

41) In a recent survey, 80% of the community favored building a police substation in their neighborhood. If 15 citizens are chosen, what is the mean number favoring the substation?

a) 7.5

b) 8

c) 12

d) 7

42) According to police sources, a car with a certain protection system will be recovered 92% of the time. If 900 stolen cars are randomly selected, what is the mean and standard deviation of the number of cars recovered after being stolen?

- a) $\mu = 450, \sigma = 15$ b) $\mu = 828, \sigma = 8.14$ c) $\mu = 450, \sigma = 225$ d) $\mu = 828, \sigma = 66.24$

43) A test consists of 10 multiple choice questions, each with five possible answers, one of which is correct. To pass the test a student must get 60% or better on the test. If a student randomly guesses, what is the probability that the student will pass the test?

- a) 0.0064 b) 0.9936 c) 0.0055 d) 0.9945

44) Test scores for an anatomy and physiology class had a mean of 79 with a standard deviation of 4.5. Test scores for the AP Government class had a mean of 69 with a standard deviation of 3.7. Suppose a student get a 65 on the anatomy and physiology test and an 64 on the AP Government test. Calculate the z-score for each test. On which test did the student perform better?

- a) Anatomy and Physiology test b) AP Government test c) Equally as well on both