

AP Statistics Semester 1 Review**Multiple Choice**

Identify the choice that best completes the statement or answers the question.

- _____ 1. A survey records many variables of interest to the researchers conducting the survey. Which of the following variables, from a survey conducted by the U.S. Postal Service, is categorical?
- number of people, both adults and children, living in the household.
 - age of respondent.
 - total household income, before taxes, in 1993.
 - years lived at that address.
 - county of residence.
- _____ 2. The mean age of five people in a room is 30 years. One of the people, whose age is 50 years, leaves the room. The mean age of the remaining four people in the room
- is 17.5.
 - is 30.
 - is 25.
 - is 40.
 - cannot be determined from the information given.
- _____ 3. In a class of 100 students, the grades on a statistics test are summarized in the following frequency table.

<u>Grade</u>	<u>Frequency</u>
91–100	11
81–90	31
71–80	42
61–70	16

The median grade is in which of the following intervals?

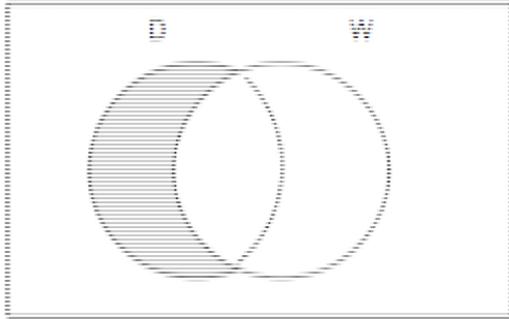
- 61–70.
 - 71–80.
 - 81–90.
 - 91–100.
 - Since the number of individual values is not known, the median cannot be determined.
- _____ 4. A set of data has a median that is much larger than the mean. Which of the following statements is most consistent with this information?
- A stemplot of the data is symmetric.
 - The data set must be so large that it would be better to draw a histogram than a stemplot.
 - A stemplot of the data is skewed left.
 - A stemplot of the data is asymmetrical.
 - A stemplot of the data is skewed right.

- _____ 5. Using the standard normal distribution tables, what is the area under the standard normal curve corresponding to $Z > -1.22$?
- a. 0.8849. b. 0.1151. c. 0.3888. d. 0.8888. e. 0.1112.
- _____ 6. Using the standard normal distribution tables, what is the area under the standard normal curve corresponding to $-0.5 < Z < 1.2$?
- a. 0.4236. b. 0.8849. c. 0.5764. d. 0.3085. e. 0.2815.
- _____ 7. A researcher is interested in determining if one can predict the score a student gets on a statistics exam from the amount of time the student spends studying for the exam. In this study, the explanatory variable is
- a. the amount of time spent studying for the exam.
b. the students taking the exam.
c. the score on the exam.
d. the fact that this is a statistics exam.
e. the researcher.
- _____ 8. Foresters use regression to predict the volume of timber in a tree using easily measured quantities such as diameter. Let y be the volume of timber in cubic feet and x be the tree's diameter in feet (measured at three feet above ground level). One set of data gives the following least-squares regression equation: $\hat{y} = -30 + 60x$
The predicted volume of timber in a tree of diameter 18 inches is
- a. 30 cubic feet.
b. 60 cubic feet.
c. 90 cubic feet.
d. 1080 cubic feet.
e. 1050 cubic feet.
- _____ 9. A least-squares regression line is fitted to a set of data. If one of the data points has a positive residual, then
- a. the point must lie near the right edge of the scatterplot.
b. the slope of the least-squares regression line must be positive.
c. the correlation between the values of the response and explanatory variables must be positive.
d. the point must lie above the least-squares regression line.
e. all of the above.

- _____ 10. Which of the following would provide evidence that a power law model describes the relationship between a response variable y and an explanatory variable x ?
- A scatterplot of the square root of y versus x looks approximately linear.
 - A scatterplot of y versus $\log x$ looks approximately linear.
 - A scatterplot of $\log y$ versus $\log x$ looks approximately linear.
 - A scatterplot of $\log y$ versus x looks approximately linear.
 - A scatterplot of y versus x looks approximately linear.
- _____ 11. I measure a response variable Y at each of several times. A scatterplot of $\log Y$ versus time of measurement looks approximately like a positively sloping straight line. We may conclude that
- A mistake has been made. It would have been better to plot $\log Y$ versus the logarithm of time.
 - the correlation between time of measurement and Y is negative, since logarithms of positive fractions (such as correlations) are negative.
 - an exponential curve would approximately describe the relationship between Y and time.
 - the rate of growth of Y is positive but slowing down over time.
 - a power function would approximately describe the relationship between Y and time.
- _____ 12. A school guidance counselor examines the number of extracurricular activities of students and their grade point average. The guidance counselor says, "The evidence indicates that the correlation between the number of extracurricular activities a student participates in and his or her grade point average is close to zero." A correct interpretation of this statement would be that
- students with good grades tend to be students that are not involved in many activities, and vice versa.
 - students involved in many extracurricular activities are just as likely to get good grades as bad grades. The same is true for students involved in few extracurricular activities.
 - active students tend to be students with poor grades, and vice versa.
 - as a student becomes more involved in extracurricular activities, there will be a change in his/her grades.
 - involvement in many extracurricular activities and good grades go hand in hand.

- _____ 13. Which of the following is an example of a *common response* lurking variable?
- Body Mass Index (BMI) is a measure of weight relative to height. Body type is in part determined by heredity. Daughters inherit half their genes from their mothers. As such, there is a direct causal link between between the BMI of mothers and daughters..
 - Smokers tend to be insecure people. Is it possible that smoking cigarettes can *cause* people to be insecure? The more likely explanation points the other way - insecure people are more likely to smoke than people who are comfortable with themselves.
 - There is a strong, positive correlation between the amount of money that people invest in mutual funds each month and how well the stock market does each month. Both variables are fuinctions of the economy. When the economy is going well, people have more money to invest and the health of the economy will also cause the stock market to perform well.
 - Many studies have found that people who actively participate in their religion live longer than nonreligious people. But religious people also exhibit many other behaviors that contribute to longer life - they exercise, and are less likely to smoke and be overweight. So there are many overlapping variables contributing to their longevity.
 - None of the above
- _____ 14. A researcher notices that in a sample of adults, those that take larger amounts of vitamin C have fewer illnesses. However, those that take larger amounts of vitamin C also tend to exercise more. As explanations for having fewer illnesses, the variables “amount of vitamin C taken” and “amount of exercise” are
- confounded.
 - symmetric.
 - skewed.
 - common responses.
 - linked.
- _____ 15. Which of the following is not a major principle of experimental design?
- control.
 - segmentation.
 - replication.
 - randomization.
 - All 4 are major principles of experimental design
- _____ 16. In order to take a sample of 90 members of a local gym, I first divide the members into men and women, and then take a simple random sample of 45 men and a separate simple random sample of 45 women. This is an example of a
- block design.
 - randomized comparative experiment.
 - double-blind simple random sample.
 - two-step sample.
 - stratified random sample.

- ___ 17. The following Venn diagram uses the following definition. D = people who exercise on weekdays.
W = people who exercise on the weekends. What does the shaded region represent?



- people who don't exercise on weekdays
- people who exercise on weekdays
- people who exercise on weekends only
- people who exercise on weekdays only
- people who never exercise

At a computer store, the current inventory of computers is shown the following chart:

	Dell	HP	Apple
Laptop	20	25	12
Desktop	19	32	8

- ___ 18. A computer is chosen at random. Find the probability of choosing a Dell given that it is a laptop.
- .351
 - .493
 - .513
 - .617
 - .428
- ___ 19. A computer is chosen at random. Find the probability of choosing a Dell or a laptop.
- .805
 - .828
 - .655
 - .747
 - .395
- ___ 20. You play bocci ball regularly with a friend and from past experience, you believe that the outcome of each match is independent. For any given match, you have a probability of .9 of winning. The probability that you win at least one of the next two matches is
- .82
 - .81
 - .95
 - .45
 - .99
- ___ 21. In a certain game of chance, your chances of winning are 0.2. If you play the game five times and outcomes are independent, the probability that you win at most once is
- 0.2.
 - 0.4096.
 - 0.3277.
 - 0.7373.
 - 0.0819.
- ___ 22. A college basketball player makes 80% of her free throws. Suppose this probability is the same for each free throw she attempts, and free throw attempts are independent. The expected number of free throws required until she makes her first free throw of the season is
- 2.
 - 0.13
 - 0.31.
 - 1.25.
 - 0.80.

- _____ 23. A small store keeps track of the number X of customers that make a purchase during the first hour that the store is open each day. Based on the records, X has the following probability distribution.

X	0	1	2	3	4
$P(X)$	0.1	0.1	0.1	0.1	0.6

Referring to the information above, the mean number of customers that make a purchase during the first hour that the store is open is

- a. 3. b. 2. c. 1. d. 2.5. e. 4.
- _____ 24. For which of the following counts would a binomial probability model be reasonable?
- The number of 7's in a randomly selected set of five random digits from a table of random digits.
 - The number of traffic tickets written by each police officer in a large city during one month.
 - The number of hearts in a hand of five cards dealt from a standard deck of 52 cards that has been thoroughly shuffled.
 - The number of phone calls received in a one-hour period.
 - All of the above.
- _____ 25. The time it takes for students to complete a standardized exam is approximately normal with a mean of 70 minutes and a standard deviation of 10 minutes. Using the 68–95–99.7 rule, what percentage of students will complete the exam in under an hour?
- a. 47.5%. b. 5%. c. 68%. d. 32%. e. 16%.

AP Statistics Semester 1 Review Answer Section

MULTIPLE CHOICE

1. ANS: E PTS: 1
2. ANS: C PTS: 1
3. ANS: B PTS: 1
4. ANS: C PTS: 1
5. ANS: D PTS: 1
6. ANS: C PTS: 1
7. ANS: A PTS: 1
8. ANS: B PTS: 1
9. ANS: D PTS: 1
10. ANS: C PTS: 1
11. ANS: C PTS: 1
12. ANS: B PTS: 1
13. ANS: C PTS: 1
14. ANS: A PTS: 1
15. ANS: B PTS: 1
16. ANS: E PTS: 1
17. ANS: D PTS: 1
18. ANS: A PTS: 1
19. ANS: C PTS: 1
20. ANS: E PTS: 1
21. ANS: D PTS: 1
22. ANS: D PTS: 1
23. ANS: A PTS: 1
24. ANS: A PTS: 1
25. ANS: E PTS: 1