Test Bank for Basic Practice of Statistics 9th Moore

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Name:_____ Class:_____ Date:_____

Chapter 0

1. The purposes of studying statistics include:
   a. gaining insight and learning from data.
   b. seeking patterns underlying variation in data.
   c. describing uncertainty in data and conclusions drawn from data.
   d. All of the answer options are correct.

ANSWER: d

2. Which of the following statements is true about learning from data?
   a. It does not matter where you get your data, as long as there are enough of them.
   b. It is important to know the context within which the problem is to be solved.
   c. It is possible to reach conclusions without knowing how the data were collected.
   d. All of the answer options are correct.

ANSWER: b

3. Relationships between two variables:
   a. are often affected by other, lurking variables.
   b. do not necessarily imply cause-and-effect relationships.
   c. can be explored using statistical procedures.
   d. All of the answer options are correct.

ANSWER: d

4. When you begin to work with a data set, you should:
   a. examine the context within which the data were collected.
   b. aim to understand the context of the problem you are trying to solve.
   c. look at graphs and summaries of quantitative data.
   d. All of the answer options are correct.

ANSWER: d

5. Drawing conclusions about the greater world based on examining patterns in variation within a sample of data is called:
   a. data analysis.
   b. data production.
   c. statistical inference.
   d. None of the answer options is correct.

ANSWER: c

6. Describing data using graphs and quantitative summaries is part of:
   a. data analysis.
   b. data production.
   c. statistical inference.
   d. None of the answer options is correct.

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Chapter 0

ANSWER: a

7. Which four-steps, applied in the order shown, answer the question "What do the data tell me?"
   a. Plan your work; solve with graphs and calculations; check accuracy; and state conclusions.
   b. Plan your work; state a problem in context; state conclusions; and show graphs and calculations.
   c. State a problem in context; plan your work; solve with graphs and calculations; and state conclusions.
   d. State a problem in context; solve with graphs and conclusions; check accuracy; and state conclusions.

ANSWER: c

8. Which of the following statements is true about variation?
   a. Variation indicates that there is a problem with the data.
   b. Variation is common in data sets.
   c. There is usually only one source of variation.
   d. All of the answer options are correct.

ANSWER: b

9. Which of the following is true?
   a. Because variation is everywhere, conclusions can be made with certainty.
   b. One of the reasons why statistics is useful is that it gives us a language that is used and understood only in university classrooms.
   c. Statistics allows us to say how confident we are about a finding based on a clinical trial.
   d. A clinical trial allows us to be certain that a vaccine reduces risk.

ANSWER: c

10. It is unethical to use randomized studies to expose humans to harmful substances. Observational studies, where we compare those exposed to those not exposed, are sometimes used in such situations. Which statement describes a possibly misleading finding from such a study?
   a. We can safely compare those exposed to those not exposed, as long as we have enough study subjects.
   b. We have to be concerned about lurking variables, which might lead us to erroneously conclude that the compound is causing the disease.
   c. If we do not carry out a randomized study, we can be sure that lurking variables will mislead us.
   d. On average, an observational study will provide us with the correct conclusion.

ANSWER: b

11. Suppose we want to study whether using social media causes changes in the GPAs of college first-year students. Which of the following would be an appropriate way to answer our question?
   a. a survey to be conducted online at the end of freshman year, in which we ask students how much time they spent on sites such as Facebook and record their GPAs.
   b. an observational study that compares the GPAs of a group of freshmen who were observed to have

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spent at least 3 hours per day on social media to those who spent less than 30 minutes per day.

c. a study that recruits volunteers who agreed to spend at least 2 hours per day on social media and another group of volunteers who agreed to spend no more than 30 minutes per day on social media.

d. None of the answer options is correct.

ANSWER: d

12. If we want to study the reasons why students binge drink, we should:

a. randomly assign students to a group that is allowed to binge drink.

b. go to a party and observe which students binge drink and which students do not, and see if we can identify differences between the two groups.

c. do a survey of students, asking about binge drinking and their reasons for doing so.

d. None of the answer options is correct.

ANSWER: c

13. A PhD student in education wants to study the relationship between the time spent studying and the grade received for students in a specific major. The student recruits 90 students and randomly assigns them to study 0.5 hour, 1 hour, 1.5 hours, or 2 hours per day for a specific subject. These students study in their assigned time bracket for the entire semester. To explore the relationship between time spent studying and grade received, at the end of the semester the PhD student could:

a. plot numerical grade received against time studied.

b. calculate averages for each time group and, if they are different, declare that time studied determines grade received.

c. look at variability in grades received. If students in different time groups have the same grade, the PhD student should conclude that there is no relationship between time studied and grade received.

d. None of the answer options is correct.

ANSWER: a

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1. Employees at a large company are surveyed about their health insurance status. Employees are coded as "1" if health insurance is obtained through the company's benefit program, "2" if health insurance is obtained from another source (such as through a spouse's employment benefit program), or "0" if the employee does not have health insurance. This variable is:

a. numerical.
b. categorical.
c. quantitatively categorical.
d. All of the answer options are correct.

ANSWER: b

2. A company has three divisions and three conference rooms for meetings. To keep track of the use of its facilities, for each meeting the company records the name of the division holding the meeting, the conference room used, and the length of time of the meeting. Which of the variables is quantitative?

a. the name of the division holding the meeting
b. the conference room used
c. the length of time of the meeting
d. All of the answer options are correct.

ANSWER: c

3. A description of different houses for sale includes the square footage of the house, whether or not the house has a finished basement, and the monthly electric bill. Which of the variables is categorical?

a. the square footage of the house
b. whether or not the house has a finished basement
c. the monthly electric bill
d. All of the answer options are correct.

ANSWER: b

4. Some of the variables from a survey conducted by the U.S. Census Bureau are the number of people living in a household, the total household gross income, and the ages of household residents. Which of the variables is or are quantitative?

a. the number of people living in a household
b. the total household gross income
c. the ages of household residents
d. All of the answer options are correct.

ANSWER: d

5. As part of a database of new births at a hospital, some of the variables recorded are the age of the mother, the marital status of the mother (such as single, married, or divorced), the weight of the baby, and the sex of the baby. Which of the following statements is or are true?

a. The individuals in this data set are births at the hospital.
b. The age of the mother and the weight of the baby are quantitative variables.
c. The sex of the baby and the marital status of the mother are categorical variables.

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Chapter 1

d. All of the answer options are correct.

ANSWER: d

6. The difference between a frequency histogram and a relative frequency histogram is that the relative frequency histogram indicates:

a. counts on the vertical (*y*) axis, whereas a frequency histogram indicates percents.

b. counts on the horizontal (*x*) axis, whereas a frequency histogram indicates percents.

c. percents of observations on the horizontal (*x*) axis, whereas a frequency histogram indicates counts.

d. percents of observations on the vertical (*y*) axis, whereas a frequency histogram indicates counts.

ANSWER: d

7. What is the difference between a histogram and a bar chart?

a. There is no difference; they are exactly the same.

b. A histogram is a more accurate representation of a bar chart.

c. A bar chart displays a quantitative variable on the horizontal axis, whereas a histogram does not.

d. A bar chart displays a categorical variable on the horizontal axis, whereas a histogram does not.

ANSWER: d

8. A poll was conducted of more than 50,000 buyers of new cars, 90 days after the cars were purchased. The data on problems per 100 vehicles for cars made by Toyota and by General Motors (GM) are given in the time plot below for the years 1998–2004. The solid line is for GM, and the dashed line is for Toyota.

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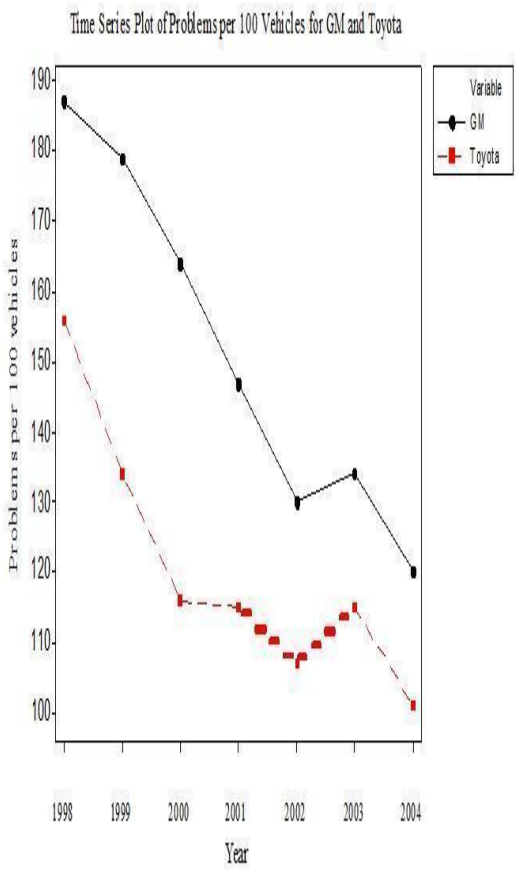

In 2002, the number of problems per 100 vehicles was:

a. about twice as high for GM as for Toyota.
b. about twice as high for Toyota as for GM.
c. about 20% higher for Toyota than for GM.
d. about 20% higher for GM than for Toyota.

ANSWER: d

9. A poll was conducted of more than 50,000 buyers of new cars, 90 days after the cars were purchased. The data on problems per 100 vehicles for cars made by Toyota and General Motors (GM) are given in the time plot below for the years 1998–2004. The solid line is for GM and the dashed line is for Toyota.

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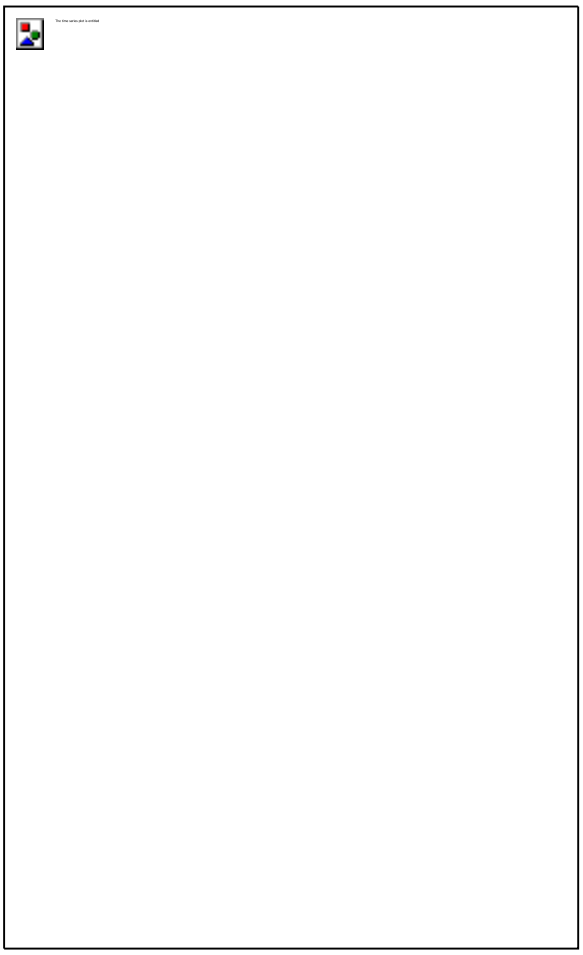

Which of the following is a true statement?

a. The quality of cars is getting poorer for both companies.
b. The number of problems was higher for GM than for Toyota in each year.
c. The difference in the number of problems per 100 vehicles between GM and Toyota is less than 30 for each year.
d. All of the answer options are correct.

ANSWER: b

10. A large university is divided into six colleges, with most students graduating from one of four of these colleges. The following bar chart gives the distribution of the percents graduating from these four most popular colleges in 2003.

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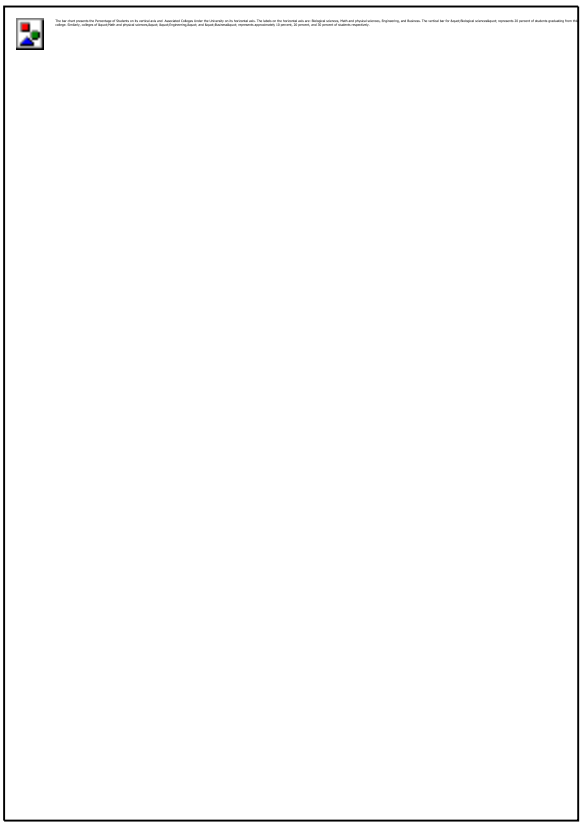

The percent of students graduating from either engineering or business is:

a. approximately 30%.
b. approximately 40%.
c. approximately 50%.
d. over 60%.

ANSWER: c

11. A large university is divided into six colleges, with most students graduating from one of four of these colleges. The following bar chart gives the distribution of the percents graduating from these four most popular colleges in 2003.

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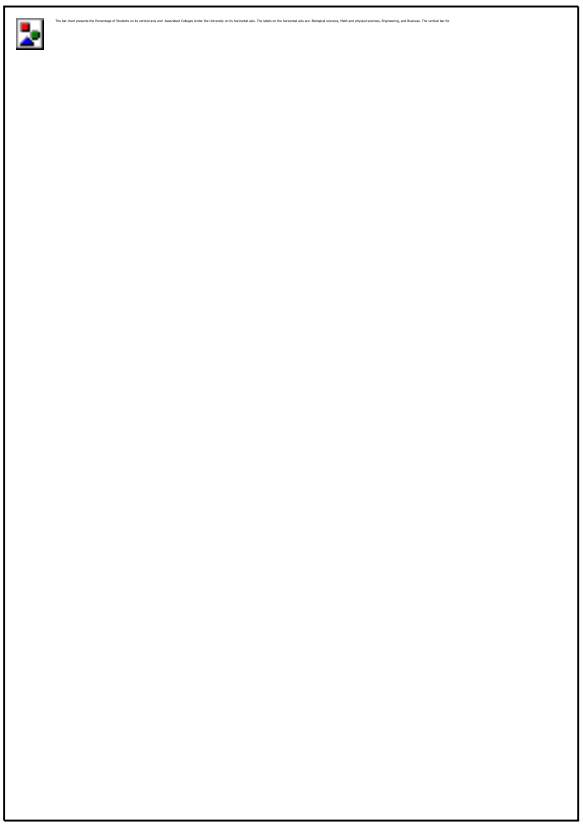

Which of the following is a correct statement?

a. A time plot of the 2003 distribution would be more informative.
b. The bar graph is skewed to the right.
c. The bar graph is skewed to the left.
d. None of the answer options is correct.

ANSWER: d

12. The following histogram represents the distribution of acceptance rates (percent accepted) among 25 business schools in 2004. In each class interval, the left endpoint, but not the right, is included, so the class intervals are $10 \leq \text{rate} < 15$, $15 \leq \text{rate} < 20$, etc.

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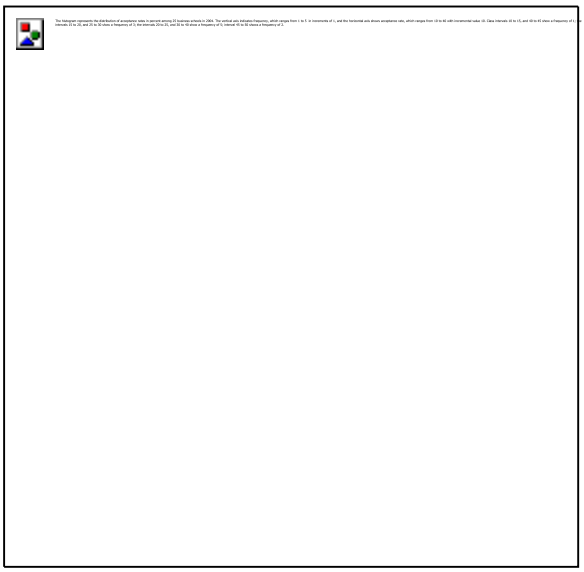
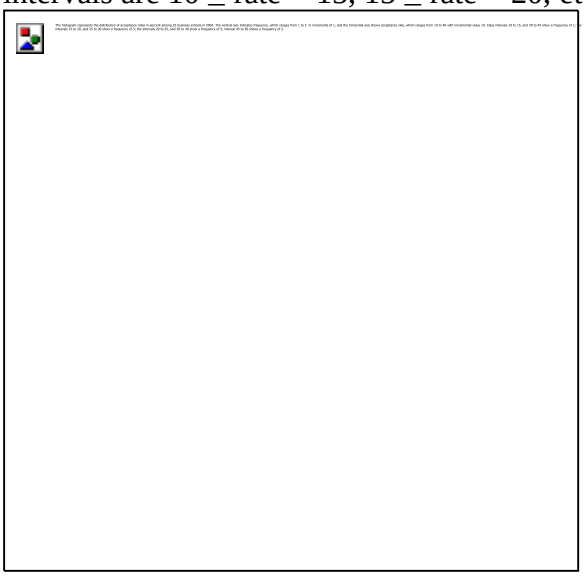


What is the approximate spread of the data?

a. 25
b. 30
c. 40
d. 50

ANSWER: c

13. The following histogram represents the distribution of acceptance rates (percent accepted) among 25 business schools in 2004. In each class interval, the left endpoint, but not the right, is included, so the class intervals are $10 \leq \text{rate} < 15$, $15 \leq \text{rate} < 20$, etc.



The number of schools with an acceptance rate greater than or equal to 30% is:

a. 5.
b. 12.
c. 10.

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d. 13.

ANSWER: d

14. The stemplot below displays midterm exam scores for 34 students taking a calculus course. The highest possible test score was 100. The teacher declared that an exam grade of 65 or higher was good enough for a grade of C or better.

```
3  6  8
4  1  4  8
5  3  3  4  4
6  2  3  3  5  5  6  7
7  0  0  1  2  3  5  6  6  8  8  9
8  1  1  3  5
9  0  3  9
```

This stemplot is most similar to:

a. a boxplot of the data.

b. a time plot of the data with the observations taken in increasing order.

c. a histogram with class intervals $30 \leq \text{score} < 40$, $40 \leq \text{score} < 50$, etc.

d. reporting the five-number summary for the data, with the mean.

ANSWER: c

15. The stemplot below displays midterm exam scores for 34 students taking a calculus course. The highest possible test score was 100. The teacher declared that an exam grade of 65 or higher was good enough for a grade of C or better.

```
3  6  8
4  1  4  8
5  3  3  4  4
6  2  3  3  5  5  6  7
7  0  0  1  2  3  5  6  6  8  8  9
8  1  1  3  5
9  0  3  9
```

The percent of students earning a grade of C or higher (as declared by the teacher) is closest to:

a. 35%.

b. 50%.

c. 65%.

d. 80%.

ANSWER: c

16. The following is a histogram showing the distribution per year of the cumulative property damage caused by tornadoes, over the period 1950 to 1999, in each of the 50 states and Puerto Rico. The data are in millions of dollars, and the class intervals are 0 to < 10, 10 to < 20, and so forth.

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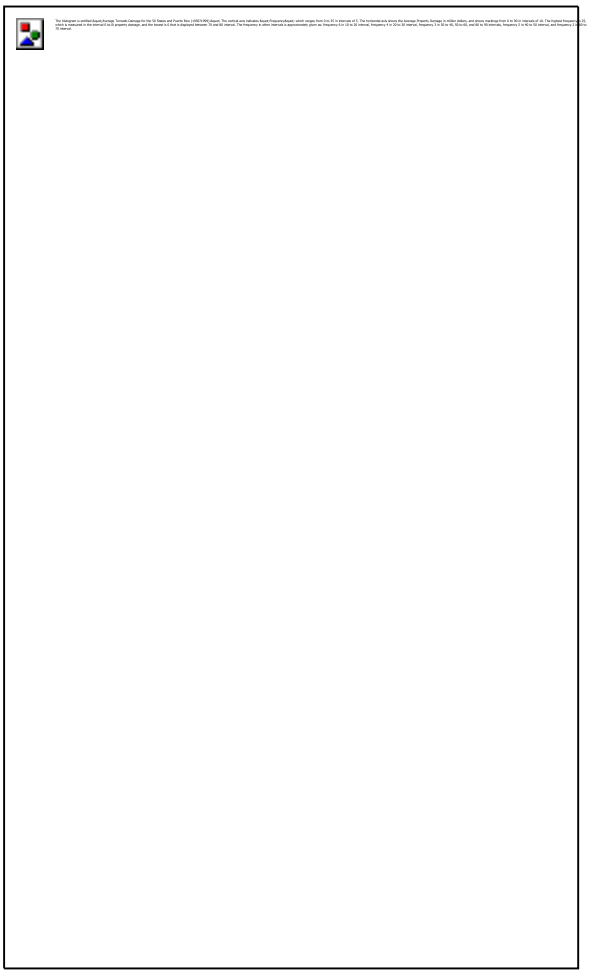

Which of the following statements is true?

a. Approximately 25% of the tornadoes caused less than $10 million in damage.
b. Approximately 25% of the annual reports of property damage were less than $10 million.
c. Approximately 50% of the annual reports of property damage were less than $10 million.
d. None of the answer options is correct.

ANSWER: c

17. The following is a histogram showing the distribution per year of the cumulative property damage caused by tornadoes, over the period 1950 to 1999, in each of the 50 states and Puerto Rico. The data are in millions of dollars, and the class intervals are 0 to < 10, 10 to < 20, and so forth.

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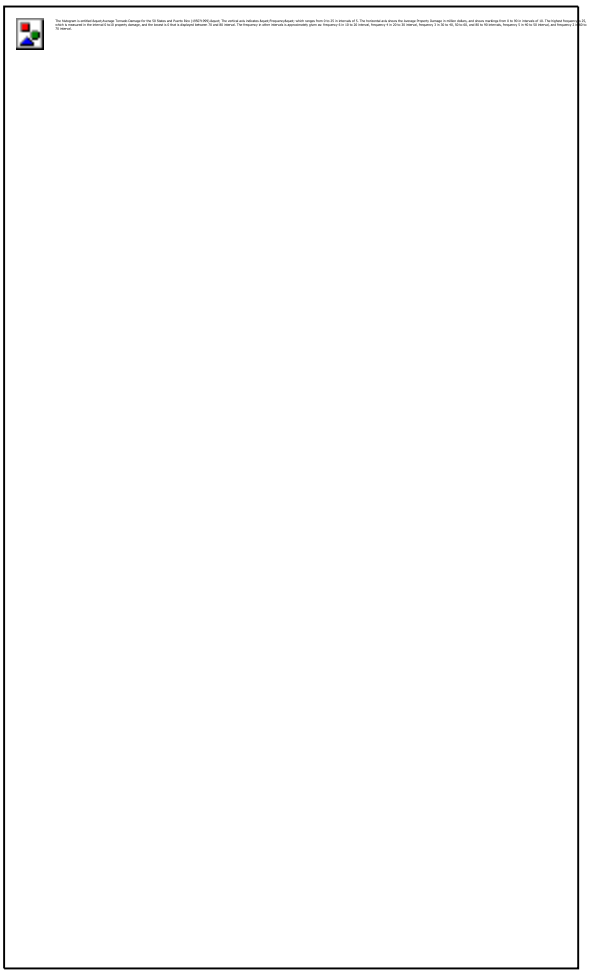

The percent of the data with average property damage of under $20 million dollars is about:

a. 20%.
b. 30%.
c. 40%.
d. 60%.

ANSWER: d

18. The following is a histogram showing the distribution per year of the cumulative property damage caused by tornadoes over the period 1950 to 1999 in each of the 50 states and Puerto Rico. The data are in millions of dollars, and the class intervals are 0 to < 10, 10 to < 20, and so forth.

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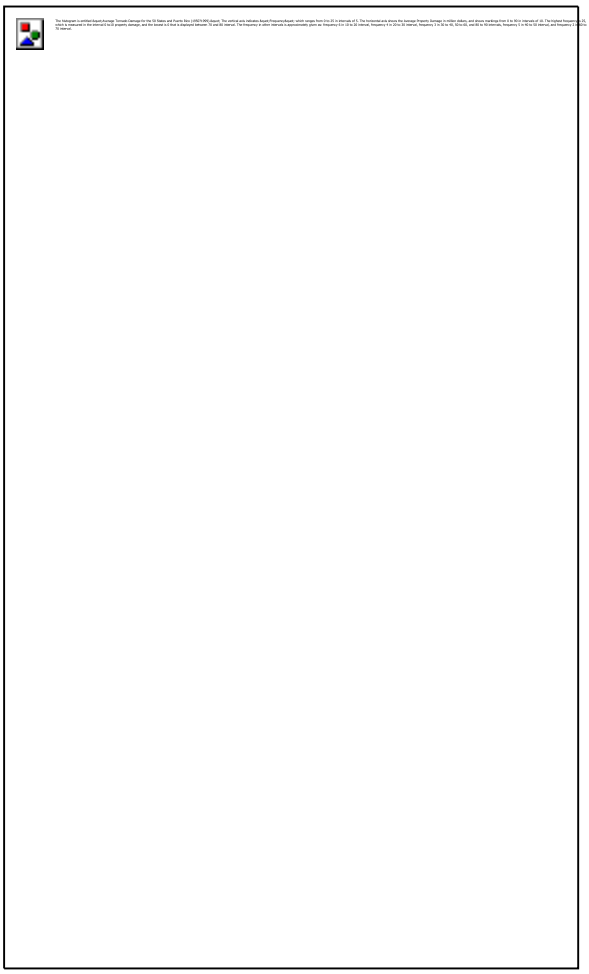

The histogram:

a. is skewed to the right.

b. shows some high outliers.

c. has a center of about $10 million dollars.

d. All of the answer options are correct.

ANSWER: d

19. A sample of 40 employees from the local Honda plant was obtained, and the length of time (in months) that each employee has worked at the plant was recorded. A stemplot of these data follows. In the stemplot, 5|2 represents 52 months.

5 2 2 3 3 4 5 7 8 9 9
6 0 0 0 2 3 4 4 4 7 7 8 8 8 9
7 3 4 5 5 6 6 7 7 7 8 8 9 9

8
9 8

What would be a better way to represent this data set?

a. Display the data in a time plot.

b. Split the stems.

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c. Use a pie chart.

d. Use a bar graph with class width equal to 10.

ANSWER: b

20. A sample of 40 employees from the local Honda plant is obtained, and the length of time (in months) that each employee has worked at the plant is recorded. A stemplot of these data follows. In the stemplot, 5|2 represents 52 months.

```
5  2  2  3  3  4  5  7  8  9  9
6  0  0  0  2  3  4  4  4  7  7  8  8  8  9
7  3  4  5  5  6  6  7  7  7  8  8  9  9

8
9  8
```

The percent of employees in the sample who have worked at the plant for less than five years is:

a. approximately zero.

b. 10%.

c. 15%.

d. 25%.

ANSWER: d

21. Consumers' Union measured the gas mileage per gallon of thirty-eight 1998–99 model automobiles on a special test track. The following pie chart provides information about the country of manufacture of the cars that Consumers' Union used.

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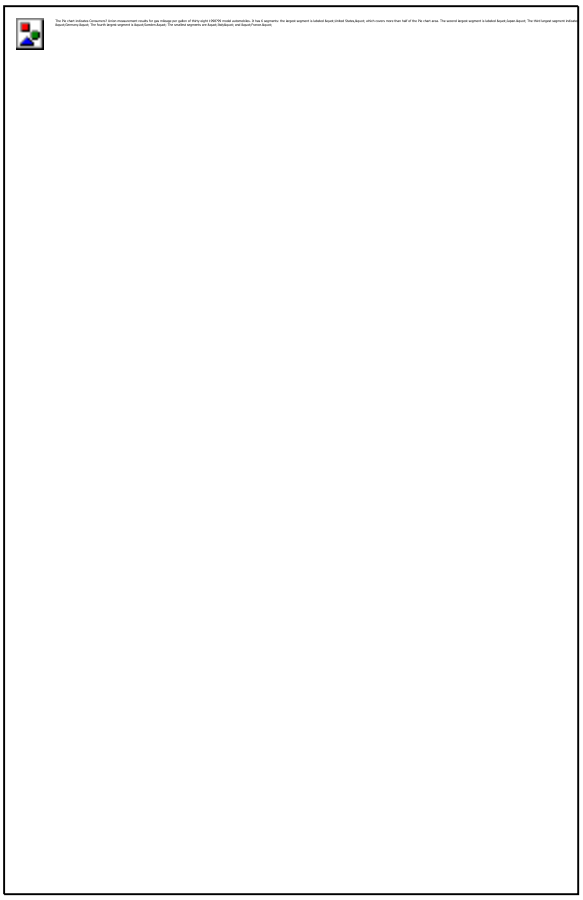

Based on this pie chart, we may conclude that:

a. Japanese cars get significantly lower gas mileage than cars of other countries. We know this because their slice of the pie is at the bottom of the chart.

b. More than half of the cars in the study were from the United States.

c. Swedish cars get gas mileage between that of Japanese cars and that of U.S. cars.

d. Mercedes Benz, Audi, Porsche, and BMW represent approximately one-quarter of the cars tested.

ANSWER: b

22. Consumers' Union measured the gas mileage per gallon of thirty-eight 1998–99 model automobiles on a special test track. The following pie chart provides information about the country of manufacture of the cars that Consumers' Union used.

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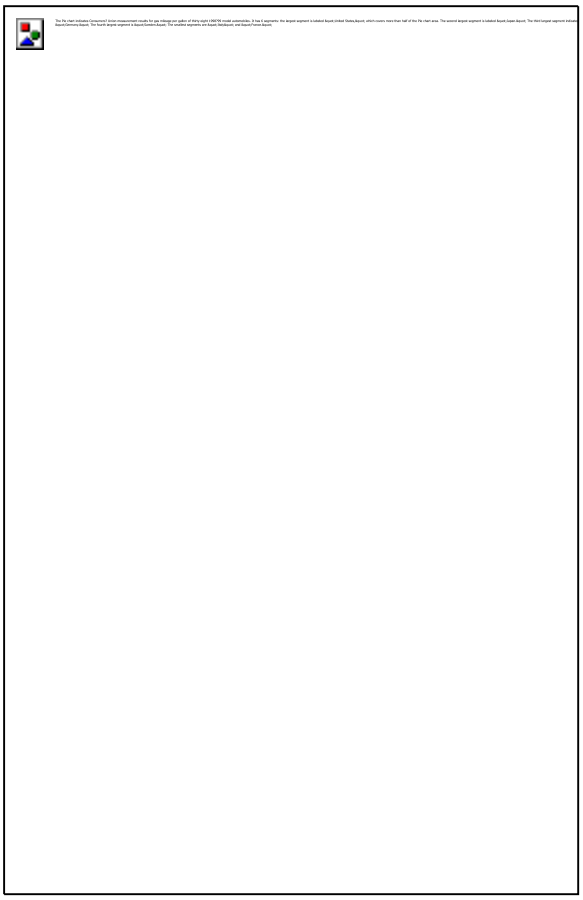
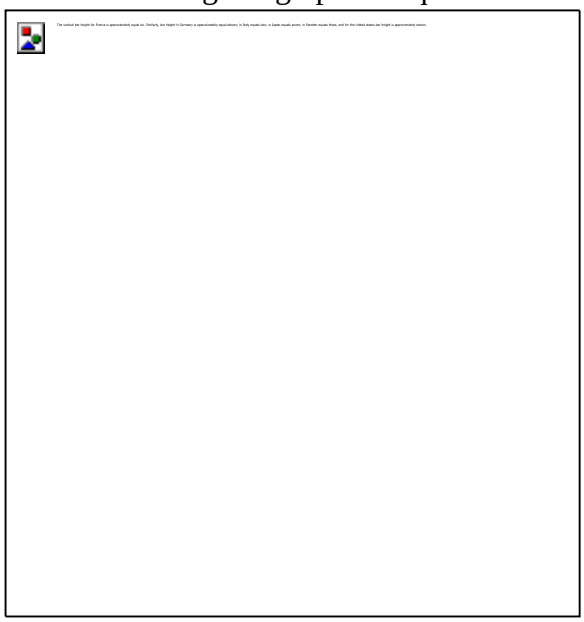


Which of the following bar graphs is equivalent to the pie chart?

a. 

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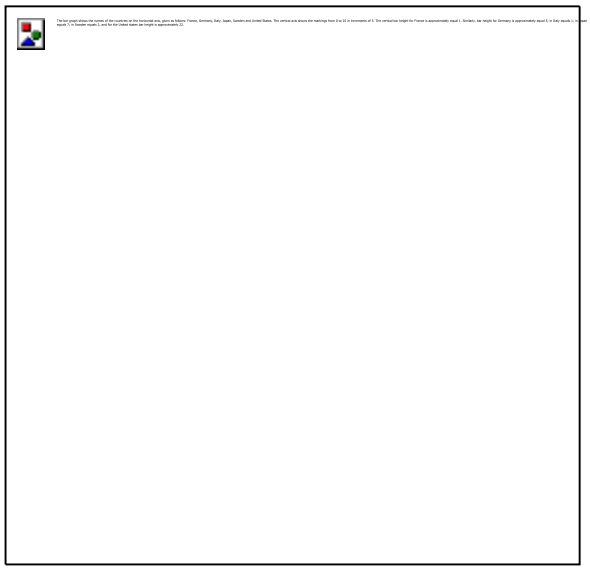
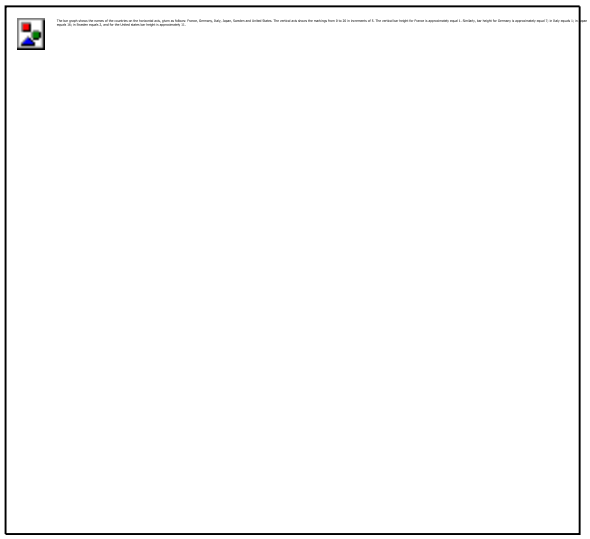
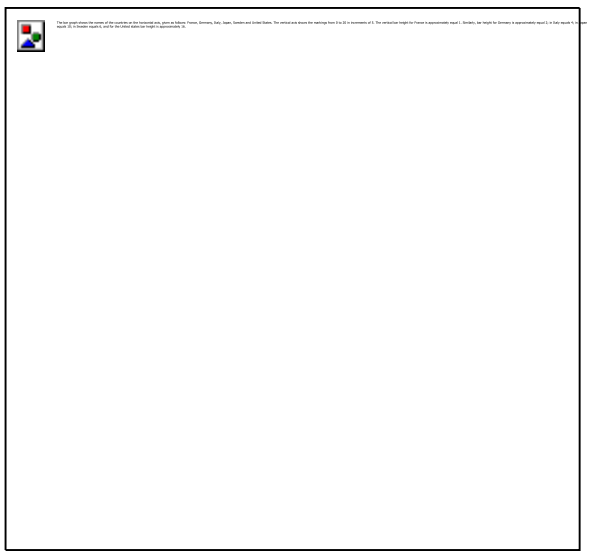
b. 

c. 

d. 

ANSWER: b

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23. Which statement best reflects what is most important to consider when creating a pie chart?
    a. You should never create a pie chart, because they are inaccurate.
    b. The area of each of the slices must be proportional to the frequency with which the observation occurs.
    c. Each observation must be contained within one (and only one) slice of the pie.
    d. The area of each of the slices must be proportional to the frequency with which the observation occurs, and each observation must be contained within one (and only one) slice of the pie.

ANSWER: d

24. Enteroliths are calcifications that form in the gut of horses. The stones can cause considerable morbidity and mortality. A study was conducted to investigate factors (such as diet and environment) that may be related to the formation of enteroliths. Housing is a variable that is coded "1" for horses that live in a stall, "2" for horses that have access to a small paddock, "3" for horses that have a large paddock, "4" for horses that live in a pasture, and "5" for other housing. Housing is a:
    a. categorical variable.
    b. quantitative variable.
    c. numerical category.
    d. None of the answer options is correct.

ANSWER: a

25. An appropriate graphical way to display housing (stall, small paddock, large paddock, pasture, or other housing) for horses is given by:
    a. a histogram.
    b. a pie chart.
    c. a stemplot.
    d. All of the answer options are correct.

ANSWER: b

26. The 137 horses in a study on enteroliths, a type of stone in the gut, were housed in a small paddock, in a large paddock, in a stall, or in a grass pasture.

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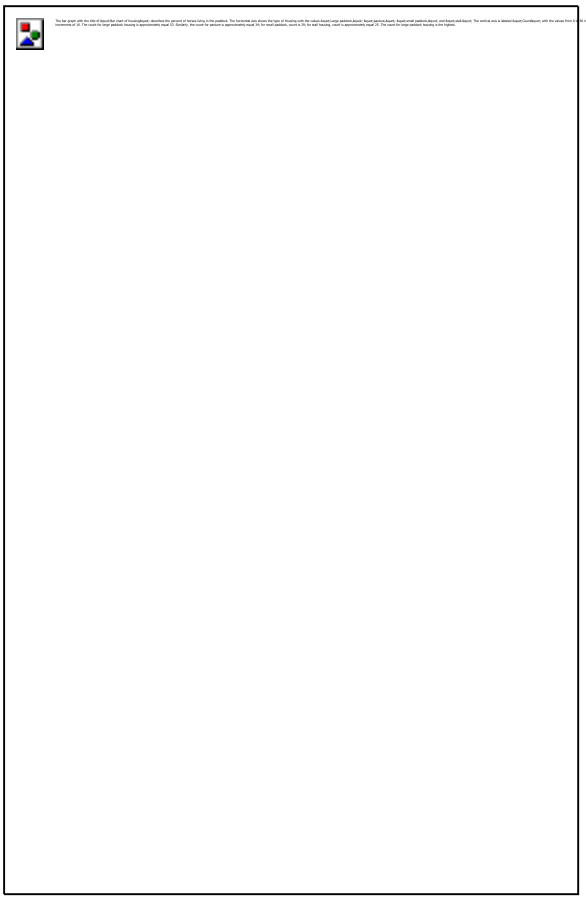

Based on the bar chart, the percent of horses living in paddocks, large or small, is approximately:

a. 38%.
b. 51%.
c. 58%.
d. 74%.

ANSWER: c

27. Veterinary researchers wanted to know if housing might be related to whether or not a horse develops enteroliths. Attached are side-by-side pie charts of housing for horses with enteroliths (cases) and horses without (controls).

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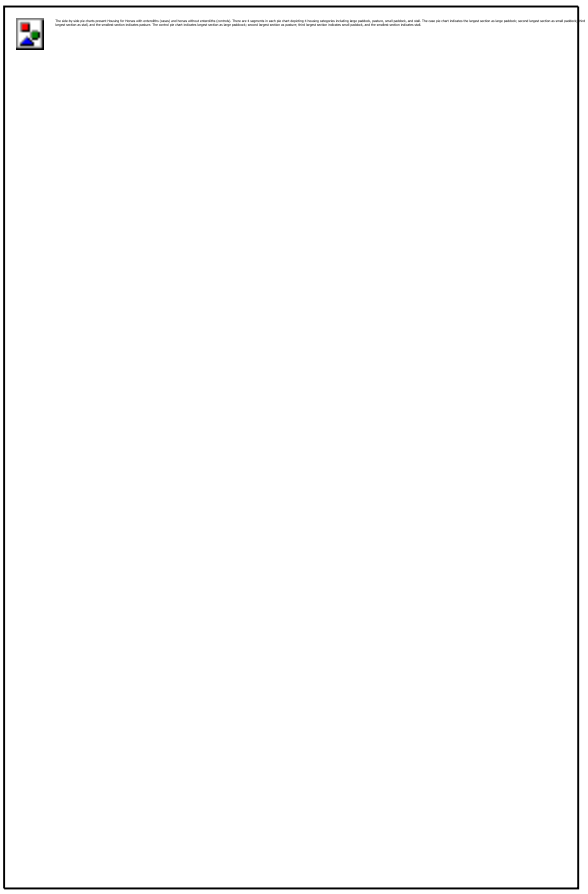

Based on these charts, it is reasonable to conclude that:

a. cases and controls are equally likely to be housed in a pasture.
b. cases are more likely to be housed in a pasture.
c. cases are less likely to be housed in a pasture.
d. the relationship cannot be determined from the pie chart.

ANSWER: c

28. Enteroliths are calcifications that form in the gut of horses. The stones can cause considerable morbidity and mortality. A study was conducted to investigate factors (such as age, diet, and environment) that may be related to the formation of enteroliths.

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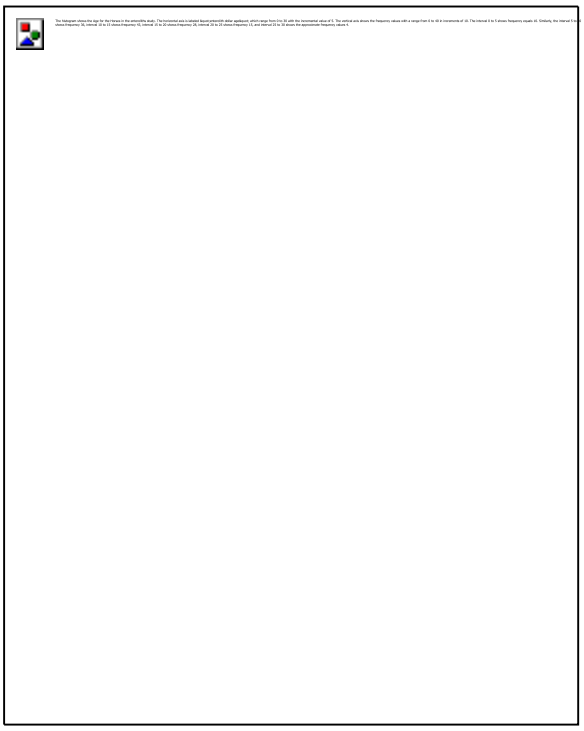

The histogram of age for the horses in the enteroliths study is:

a. slightly left-skewed.

b. symmetric.

c. bimodal.

d. slightly right-skewed.

ANSWER: d

29. Enteroliths are calcifications that form in the gut of horses. The stones can cause considerable morbidity and mortality. A study was conducted to investigate factors (such as age, diet, and environment) that may be related to the formation of enteroliths.

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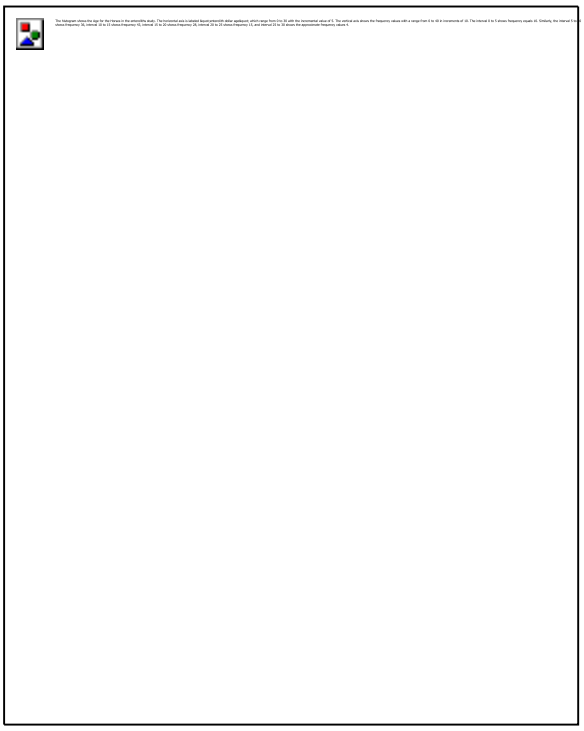

The number of horses between 10 and 20 years of age in the enterolith study is approximately:

a. 28.
b. 42.
c. 51.
d. 70.

ANSWER: d

30. Enteroliths are calcifications that form in the gut of horses. The stones can cause considerable morbidity and mortality. A study was conducted to investigate factors (such as age, diet, and environment) that may be related to the formation of enteroliths. The researchers decided to draw two histograms: one for horses with enteroliths (cases) and one for horses without (controls).

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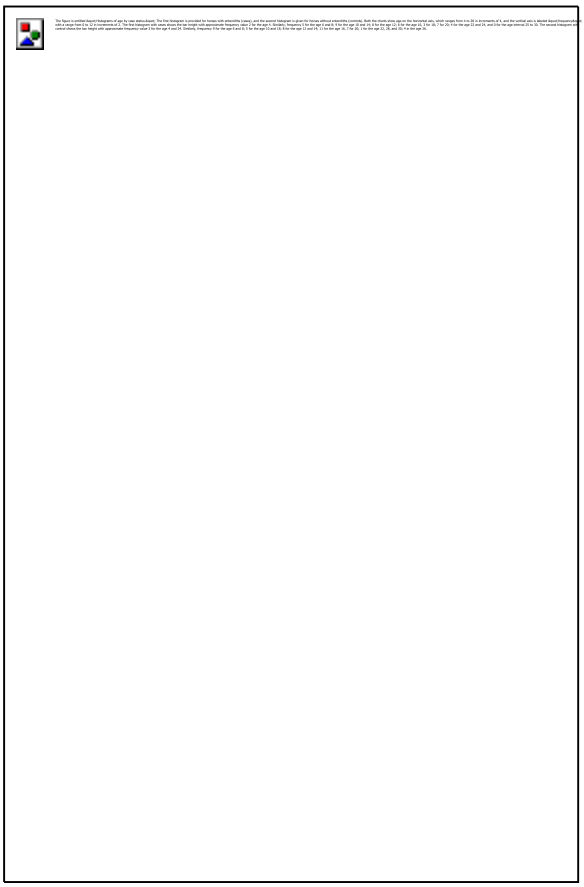

It can be deduced from the histograms that the cases are:

a. slightly younger than the controls.
b. slightly older than the controls.
c. about the same age as the controls.
d. None of the answer options is correct.

ANSWER: a

31. Enteroliths are calcifications that form in the gut of horses. The stones can cause considerable morbidity and mortality. A study was conducted to investigate factors (such as age, diet, and environment) that may be related to the formation of enteroliths. The researchers decided to draw two histograms: one for horses with enteroliths (cases) and one for horses without (controls).

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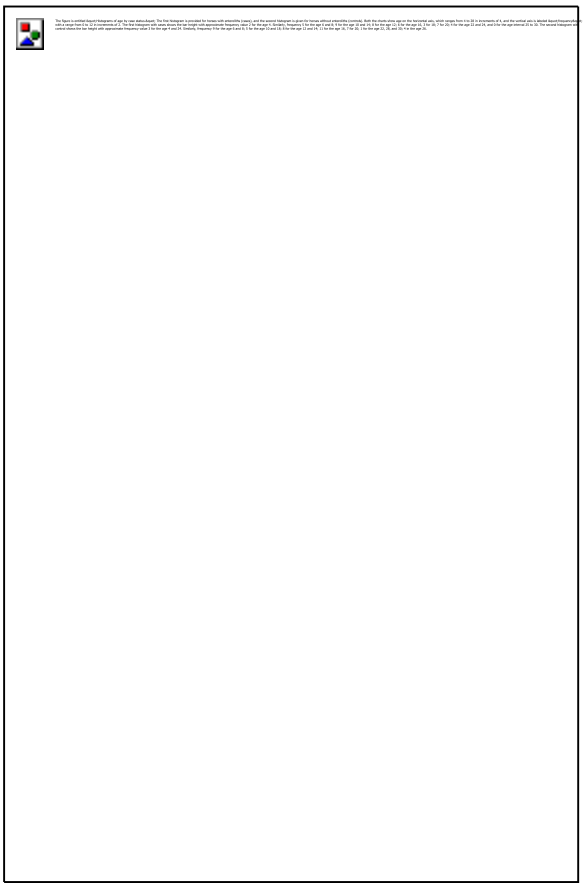

The number of horses 20 years and older:

a. is larger among the cases.
b. is smaller among the cases.
c. is about the same for both.
d. cannot be determined from the histogram.

ANSWER: b

32. A survey of radio stations was conducted following the attacks on the World Trade Center in 2001. One of the variables recorded was the region in which the station was located (east, center, or west). The variable "region" is:

a. quantitative, because region is not a number.
b. quantitative, because region is a number.
c. categorical, because region is not a number.
d. categorical, because region is a number.

ANSWER: c

33. A survey of radio stations was conducted following the attacks on the World Trade Center in 2001. One of the variables recorded was the region in which the station was located (east, center, or west). The variable "region" can be summarized by:

a. a bar graph only.

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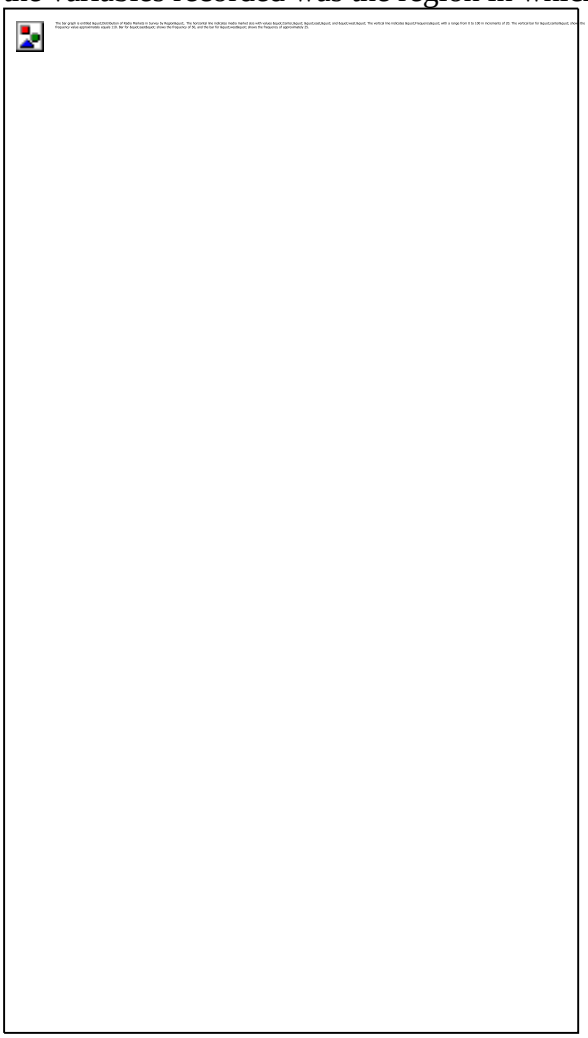
b. a pie chart only.
c. a histogram only.
d. a bar graph or a pie chart.

ANSWER: d

34. A survey of radio stations was conducted following the attacks on the World Trade Center in 2001. One of the variables recorded was the region in which the station was located (east, center, or west).



The bar graph above shows that the location of the majority of radio stations:

a. is in the west.
b. is in the center.
c. is in the east.
d. cannot be determined from a bar graph.

ANSWER: b

35. A survey of radio stations was conducted following the attacks on the World Trade Center in 2001.

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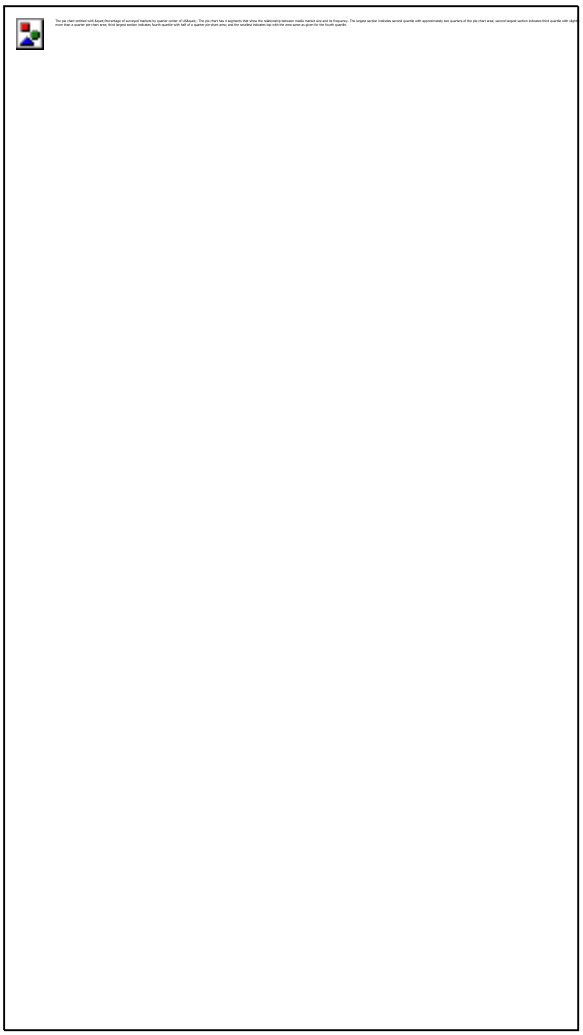

In the pie chart above, the proportion of radio markets in the second quarter in the center of the U.S. is approximately:

a. 10%.
b. 20%.
c. 40%.
d. 60%.

ANSWER: c

36. A survey of radio stations was conducted following the attacks on the World Trade Center in 2001. The station rankings were included in the survey. The histogram below has the interval limits $0 \le ranking < 50$, $50 \le ranking < 100$, $100 \le ranking < 150$, $150 \le ranking < 200$, and $200 \le ranking < 250$.

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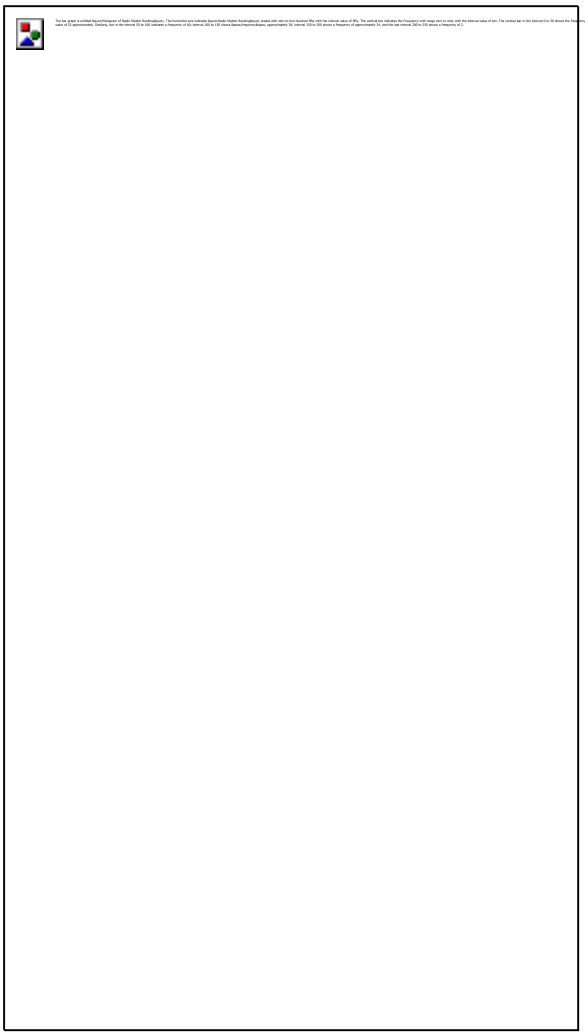

A ranking of 100:

a. will be counted in interval 2.
b. will be counted in interval 3.
c. can be in either interval 2 or interval 3.
d. cannot be determined from the histogram.

ANSWER: b

37. A survey of radio stations was conducted following the attacks on the World Trade Center in 2001. The station rankings were included in the survey. The histogram below has the interval limits $0 \le ranking < 50$, $50 \le ranking < 100$, $100 \le ranking < 150$, $150 \le ranking < 200$, and $200 \le ranking < 250$.

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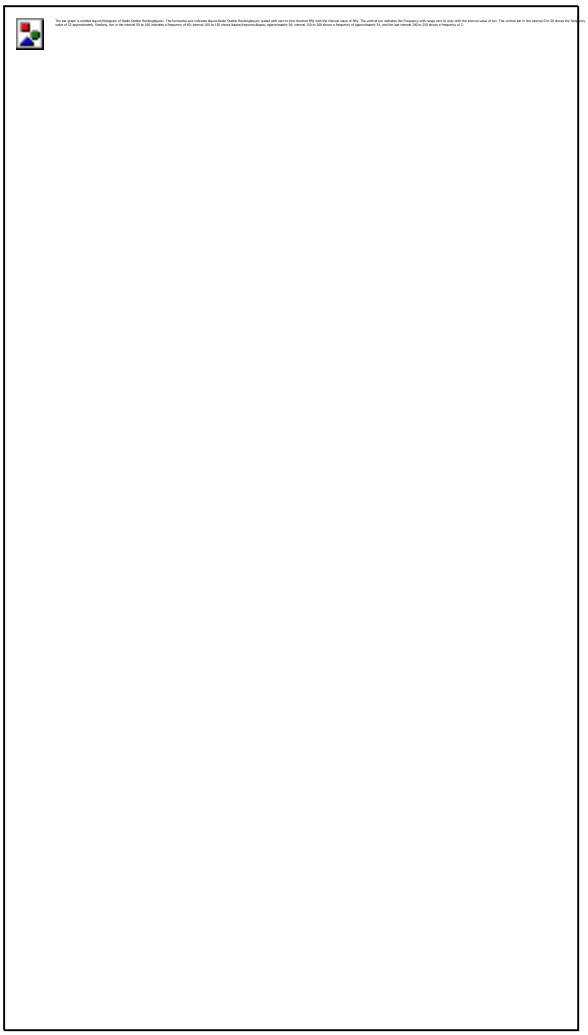

A plot of the histogram, above, shows the histogram to be:

a. symmetric.
b. left-skewed.
c. right-skewed.
d. bimodal.

ANSWER: c

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