TestBanks Chapter 1: Looking at Data

1 A study is conducted on students taking a statistics class. Several variables are recorded in the survey. Identify each variable as categorical or quantitative.
A) The type of car the student owns
B) The number of credit hours taken during that semester
C) The time the student waited in line at the bookstore to pay for his/her textbooks
D) The home state of the student
Answer:

A) Categorical, B) Quantitative, C) Quantitative, D) Categorical

2 Researchers are conducting a state-wide survey for the U.S. Postal Service. The survey records many different variables of interest. Which of the following variables is categorical?
- (•) The county of residence
- ( ) The number of people, both adults and children, living in the household
- ( ) The total household income, before taxes, in 2010
- ( ) The age of the respondent

3 A particularly common question in the study of wildlife behavior involves observing contests between "residents" of a particular area and "intruders." In each contest, the residents either win or lose the encounter (assuming there are no ties). Observers might record several variables, some of which are listed below. Which of these variables is categorical?
- ( ) The duration of the contest (in seconds)
- ( ) The number of animals involved in the contest
- (•) Whether the residents win or lose
- ( ) The total number of contests won by the residents

4 A description of different houses on the market includes the following three variables. Which of these variables is quantitative?
- ( ) The square footage of the house
- ( ) The monthly gas bill
- ( ) The monthly electric bill
- (•) All of the above

5 Jason is buying a new computer. He is comparing various models using many different variables. These variables play an important role in making the decision about which

computer he will buy. Identify each of the following variables as categorical or quantitative.
A) Does the computer come with a USB port?
B) What is the hard drive size of the computer?
C) Is the computer a laptop or a desktop model?
D) How much does the computer cost?

Answer:

A) Categorical, B) Quantitative, C) Categorical, D) Quantitative

6 A variable is a characteristic of a

- (•) case.
- ( ) label.
- ( ) value.
- ( ) None of the above

7 Categorical variables place cases into _____ group(s).

- ( ) one
- ( ) no
- (•) many
- ( ) numeric

8 Variables that take numeric values for which arithmetic operations make sense are called _____.

- (•) quantitative
- ( ) categorical
- ( ) distributions
- ( ) cases

9 A type of variable where arithmetic operations do not make sense are called _____.

- ( ) quantitative
- (•) categorical
- ( ) distributions
- ( ) cases

10 Variables take on _____.

- (•) values
- ( ) cases
- ( ) distributions
- ( ) None of the above

11 What are labels used for in data sets?

- To identify distributions
- To identify values
- (•) To identify cases
- None of the above

12 We have a data set where the cases are college students. One of the variables in the data set is "gender." The values of gender are 1 if the student is male and 2 if the student is female. What type of variable is gender?

- Quantitative
- (•) Categorical
- Quantitative and categorical
- None of the above

13 We have a data set where the cases are college students. One of the variables in the data set is "age of the student." What type of variable is age of the student?

- (•) Quantitative
- Categorical
- Quantitative and categorical
- None of the above

14 We have a data set where the cases are college students. One of the variables in the data set is "hometown." What type of variable is hometown?

- Quantitative
- (•) Categorical
- Quantitative and categorical
- None of the above

15 The units of measurement are an important part of the description of what type of variables?

- (•) Quantitative
- Categorical
- Quantitative and categorical
- None of the above

16 We have a data set where the cases are college students. One of the variables in the data set is "grade." The values of grade are 4 if the student received an A, 3 if the student received a B, 2 if the student received a C, 1 if the student received a D, and 0 if the student received an A. What type of variable is grade?

- (•) Quantitative
- Categorical
- Quantitative and Categorical

- None of the above

17 Suppose you are interested in comparing the quality of different hospitals based on infections occurred from surgery. What would be the best way to measure such a variable?

- (•) Rate of infections
- ( ) Count of infections
- ( ) None of the above

18 Suppose you own a pizza delivery company and you are trying to determine the best campus on which to sell pizza. What would be the best measurement to make the comparison?

- ( ) Average number of pizzas purchased
- (•) Count of pizzas purchased
- ( ) Rate of pizzas purchased
- ( ) None of the above

19 The first day of class the professor collects information on each student to make a data set that will be analyzed throughout the semester. The information asked includes hometown, GPA, number of classes, number of siblings, and favorite subject. How many variables are in this data set?

- ( ) 1
- ( ) 2
- (•) 5
- ( ) None of the above

20 The first day of class, the Professor collects information on each student to make a data set that will be analyzed throughout the semester. The information asked includes; hometown, GPA, number of classes taking, number of siblings, and favorite subject. How many quantitative variables are in this data set?

- ( ) 1
- ( ) 2
- (•) 3
- ( ) 5

21 The first day of class the professor collects information on each student to make a data set that will be analyzed throughout the semester. The information asked includes hometown, GPA, number of classes, number of siblings, and favorite subject. How many categorical variables are in this data set?

- ( ) 1
- (•) 2

- 3
- 4

22 The first day of class the professor collects information on each student to make a data set that will be analyzed throughout the semester. The information asked includes hometown, GPA, number of classes, number of siblings, and favorite subject. What are the cases in this data set?

- The semester
- The professor
- The college students
- None of the above

23 Categorical variables are best displayed by _____.

- histograms
- pie charts
- bar graphs
- pie charts or bar graphs

24 The distribution of a categorical variable is displayed using _____.

- letters
- counts
- percentages
- counts or percentages

25 When using a pie chart, the sum of all the percentages should be _____.

- 0
- 1
- 100
- 50

26 Quantitative variables are best displayed using _____.

- stemplots
- pie charts
- bar graphs
- pie charts or bar graphs

27 Consider the following data which describe the amount of time in minutes students spend studying for a quiz:
10, 11, 11, 12, 12, 14, 15, 18, 19, 20, 22, 24, 39, 40, 41, 44, 46, 50, 52, 52, 53, 55, 70.
What numbers make up the leaf of the first stem?

- 0,1,1,2,2,4,5,8,9

- 0,1,2,4,5,8,9
- 0,1,1,2,2,4,5,8,9,0,2,4,9,0,1,4,6,0,2,2,3,5,0
- None of the above

28 Consider the following data which describe the amount of time in minutes students spend studying for a quiz:
10, 11, 11, 12, 12, 14, 15, 18, 19, 20, 22, 24, 39, 40, 41, 44, 46, 50, 52, 52, 53, 55, 70.
What numbers make up the leaf of the last stem?

- 0,1,1,2,2,4,5,8,9
- 0,1,4,6
- 0, 2,2,3,5, 0
- None of the above

29 Consider the following data which describe the amount of time in minutes students spend studying for a quiz:
10, 11, 11, 12, 12, 14, 15, 18, 19, 20, 22, 24, 39, 40, 41, 44, 46, 50, 52, 52, 53, 55, 70.
What numbers make up the stem?

- 1,2,3,4,5,6,7
- 1,2,3,4,5,7
- 0,1,1,2,2,4,5,8,9,0,2,4,9,0,1,4,6,0,2,2,3,5,0
- None of the above

30 Consider the following data which describe the amount of time in minutes students spend studying for a quiz:
10, 11, 11, 12, 12, 14, 15, 18, 19, 20, 22, 24, 39, 40, 41, 44, 46, 50, 52, 52, 53, 55, 70.
What numbers make up the leaf of the first stem if you were splitting the stems?

- 0,1,1,2,2,4,5,8,9
- 0,1,2,4,5,8,9
- 0,1,1,2,2,4
- 0, 1, 2, 4

31 Consider the following data which describe the amount of time in minutes students spend studying for a quiz:
10, 11, 11, 12, 12, 14, 15, 18, 19, 20, 22, 24, 39, 40, 41, 44, 46, 50, 52, 52, 53, 55, 70.
What numbers make up the leaf of the last stem if you were splitting the stems?

- 0, 2, 2, 3, 5, 0
- 0, 2, 3, 5
- 0
- No leaves on the last stem

32 When making a stemplot, it is appropriate to _____ if the values have many digits.

- split the stems
- split the leaves
- trim the stems
- trim the leaves

33 When making a stemplot, it is appropriate to _____ if the values cover a very small range.

- split the stem
- split the leaves
- trim the stem
- trim the leaves

34 What method is useful when comparing two distributions using a stemplot?

- Splitting the stem
- Trimming the leaves
- Back-to-back stemplots
- None of the above

35 Thirty students were asked, “How much time did you spend studying for the last quiz?” The histograms below were all used on the same data; however, the class size was changed for each one. Which histogram below best displays the data?

-
-
-
-

36 The stemplot below displays data from 30 students who were asked, “How much time in minutes do you spend on the Internet?” What do you notice about the stemplot?

Variable: Time spent on the Internet

The decimal point is 2 digits to the right of the colon.

0 : 111123334
0 : 59
1 : 022
1 :
2 : 013333
2 : 5
3 : 224
3 :
4 :
4 :
5 : 4
5 : 678

6 :
6 : 5
7 :
7 :
8 :
8 : 7

- ○ The stems were split.
- ○ The leaves were trimmed.
- ◉ The stems were split and the leaves were trimmed.
- ○ None of the above

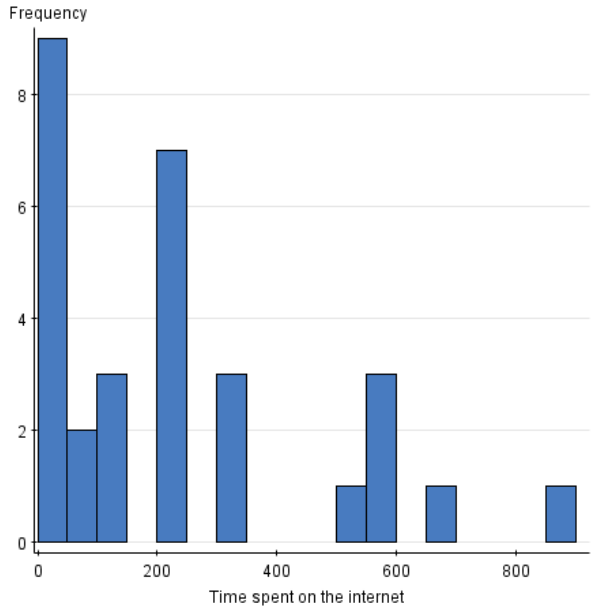
37 Large data sets with quantitative variables are best displayed using _____.

- ○ stemplots
- ◉ histograms
- ○ stemplots and histograms
- ○ none of the above

38 When making histograms, the classes _____.

- ◉ should be equal width
- ○ do not need to be equal width
- ○ should be selected randomly
- ○ should always be a width of 10

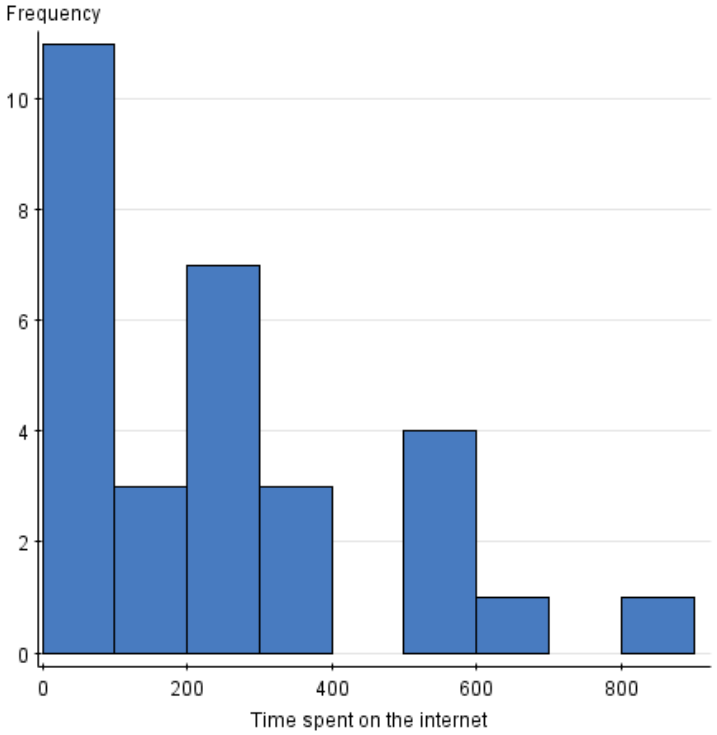
39 The histogram below shows data from 30 students who were asked, "How much time do you spend on the Internet in minutes?" How could you improve the histogram to better display the distribution?



- ◉ Increase the class size.
- ○ Decrease the class size.
- ○ Do nothing—the histogram is appropriate.

- Add two more data points.

40 The histogram below shows data from 30 students who were asked, "How much time do you spend on the Internet in minutes?" What are some features about the data?



- There is a potential outlier.
- Most values are around 800.
- The range of values is between 0 and 400.
- None of the above

41 The appearance of a histogram will change when you _____.

- change the class size
- add more data
- remove outliers
- All of the above

42 The tails of a distribution show the _____.

- center
- extreme values
- median
- None of the above

43 When using a histogram to display categorical values, you should make sure the categories are in alphabetical order.

- True—histograms are not useful if the categories are not in order.

○ True—histograms can be used on any type of data.
◉ False—You cannot use histograms to display categorical data.
○ False—The categories cannot be in alphabetical order when displaying categorical data.

44 When displaying the distribution of quantitative data, it is best to use

○ pie charts.
○ bar graphs.
○ histograms.
◉ stemplots or histograms.

45 A sample of employees of a large pharmaceutical company has been obtained. The length of time (in months) they have worked for the company was recorded for each employee. A stemplot of these data is shown below. In the stemplot 6|2 represents 62 months.

```
62| 2 3 3 4 5 7 8 9
70| 0 0 2 3 4 4 4 5 6 7 8 8 8 9
80| 0 1 1 2 3 4 4 4 5 7 9 9 9
90| 0 0 1 1 1 2 3 5 8
```

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

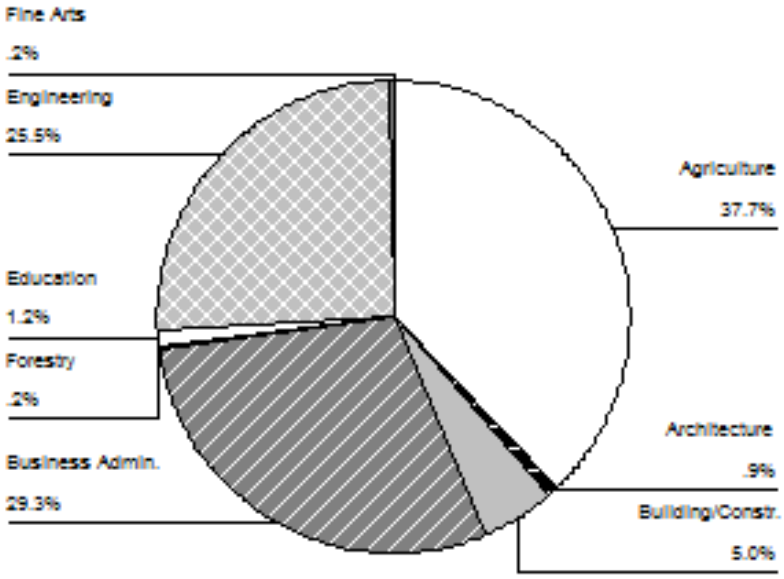
○ Display the data in a time plot.
○ Display the data in a boxplot.
◉ Split the stems.
○ Use a histogram with class width equal to 10.

46 Data are collected from 1100 randomly selected students who graduated between 2005 and 2008 from the University of Florida. Some of the variables that were collected are listed below. Identify each of the following variables as categorical or quantitative.
A) Gender of the student
B) School/college from which the student graduated
C) Annual salary of the first job after graduation
D) Graduation date in terms of semester (e.g., Fall 2005, Spring 2006, etc.)
Answer:

A) Categorical, B) Categorical, C) Quantitative, D) Categorical

47 Data are collected from 1100 randomly selected students who graduated between 2005 and 2008 from the University of Florida. A pie chart of the departments in the school/college from which the 1100 sampled students

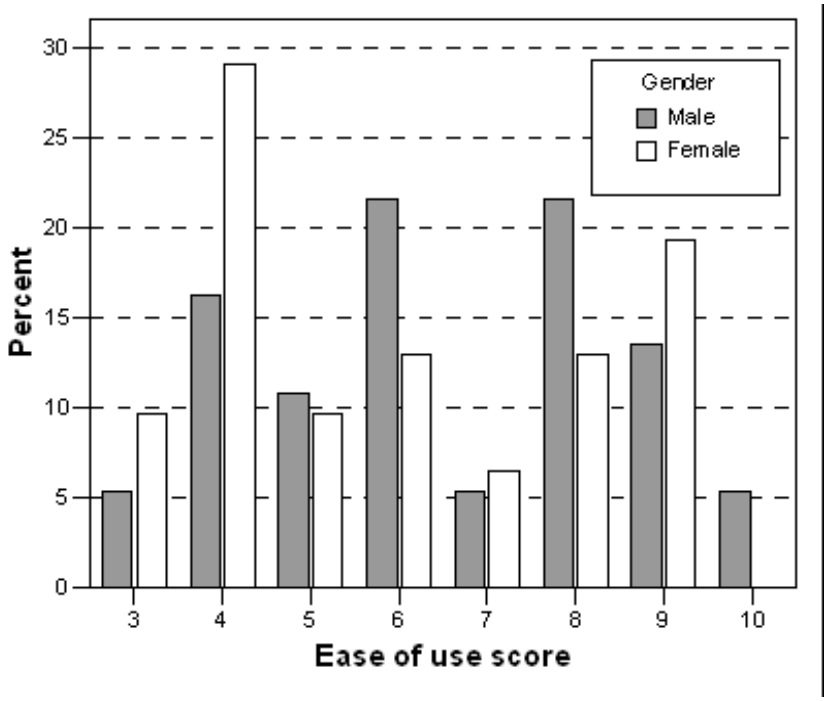
graduated is shown below.



Based on the graph, (approximately) how many of the sampled students graduated with a degree in Building/Construction or Architecture?

- 55
- 59
- 65
- 99

48 A distributor of electronics is doing a customer satisfaction survey for a manufacturer of tablet computers. A sample of 68 clients is asked to rate a particular tablet on appearance, functionality, ease of use, and price on a scale of 1 to 10, where 1 corresponds to the worst rating and 10 to the best possible rating. A bar graph of the ease of use ratings classified by gender is given below.



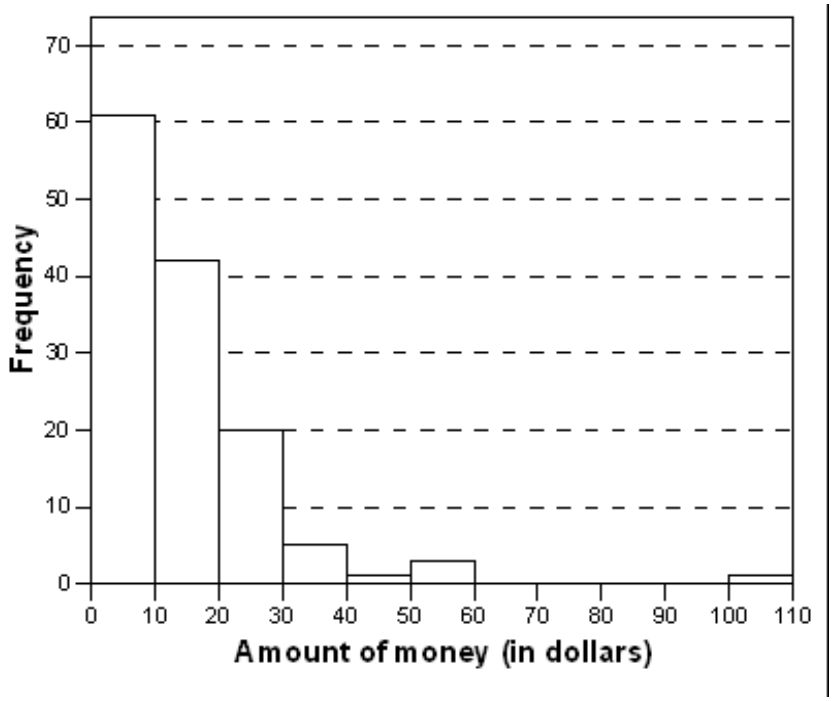
What percentage of the sampled female clients rated the tablet as not so easy to use (a rating of 4 or lower)?

- 28%
- 29%
- 38%
- 62%

49 When drawing a histogram, it is important to

- have a separate class interval for each observation to get the most informative plot.
- make sure the heights of the bars exceed the widths of the class intervals, so that the bars are true rectangles.
- label the vertical axis so the reader can determine the counts or percentage in each class interval.
- make certain the mean and median are contained in the same class interval, so that the correct type of skewness can be identified.

50 In a statistics class with 136 students, the professor records how much money each student has in their possession during the first class of the semester. The histogram shown below represents the data he collected.



What is approximately the percentage of students with under $10 in their possession?

- 35%
- 40%
- 44%
- 50%

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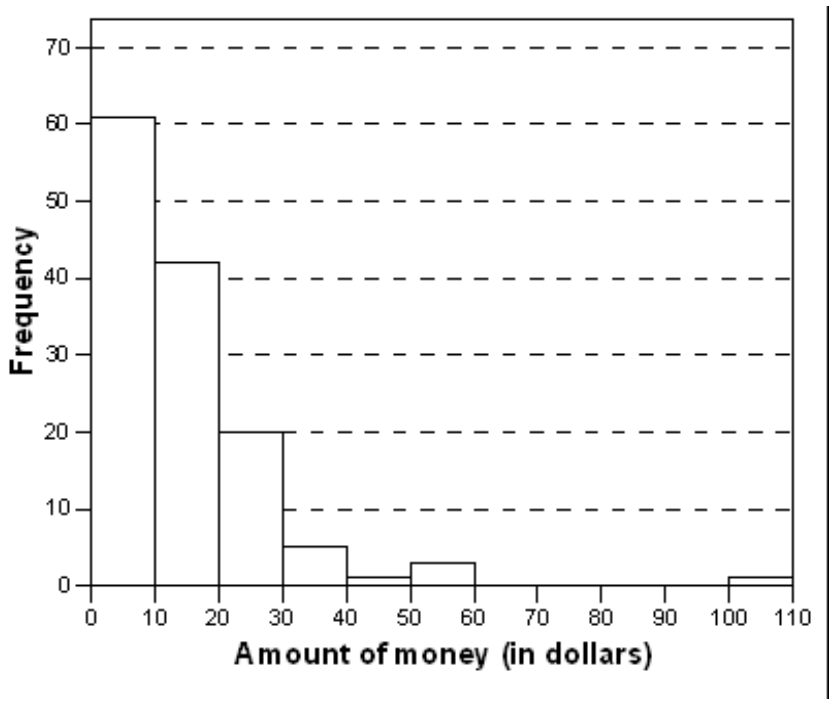
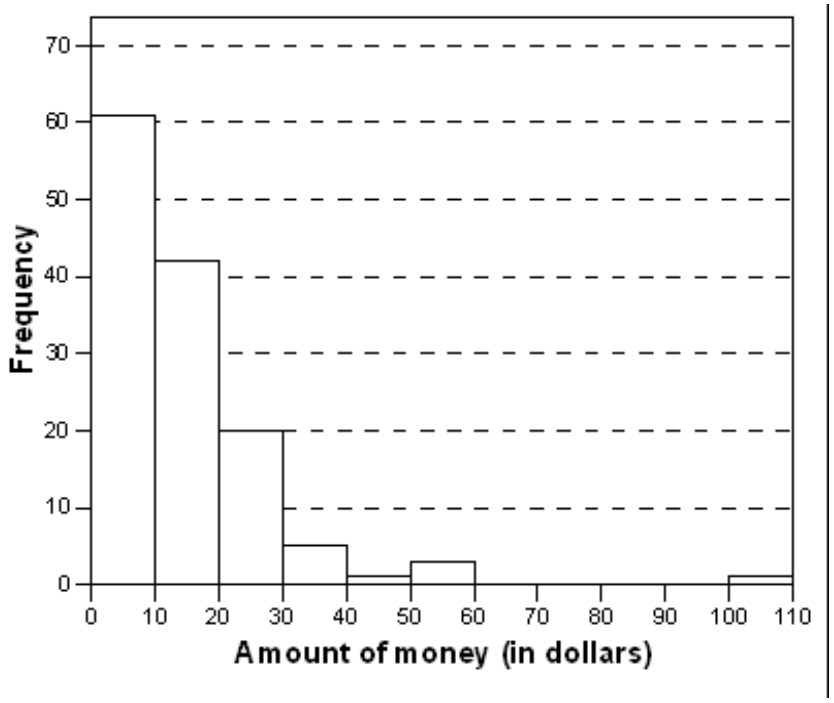


Which of the following description(s) is/are correct regarding the shape of the histogram?

Answer:

Skewed right
An outlier is present.
Unimodal

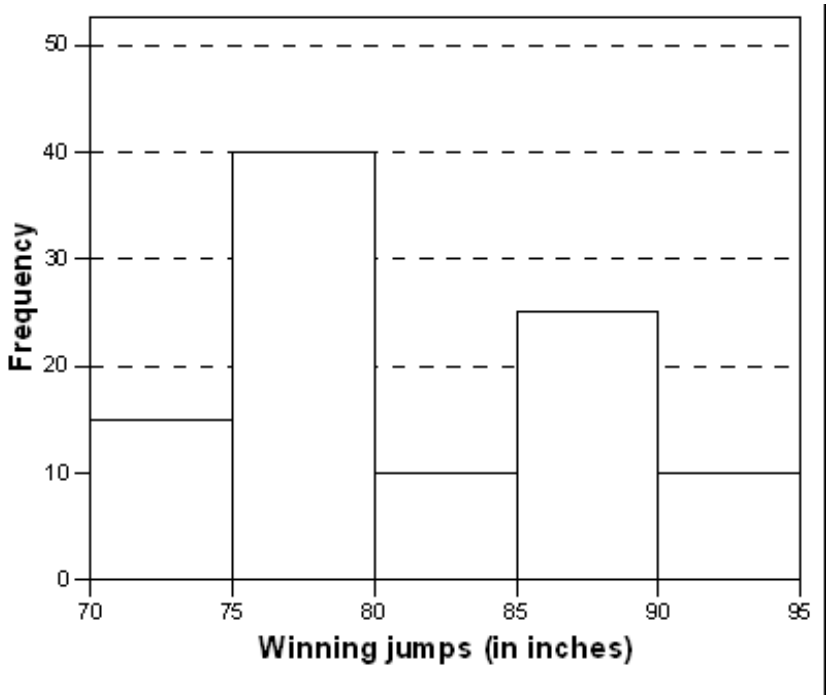
52 In a statistics class with 136 students, the professor records how much money each student has in their possession during the first class of the semester. The histogram shown below represents the data he collected.



What is approximately the number of students with $30 or more in their possession?

- Less than 5
- About 10
- About 30
- More than 100

53 The histogram below represents the height (in inches) of the gold medal–winning high jumps for the Olympic Games up to Sydney 2000.



What is approximately the mean height?

- 75 inches
- 77.5 inches
- 82 inches
- 90 inches

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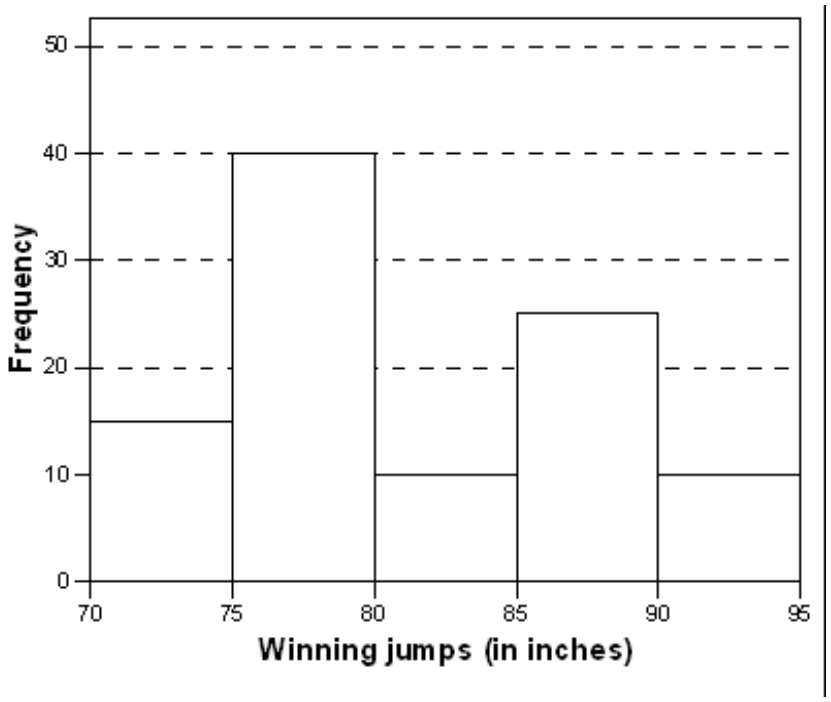
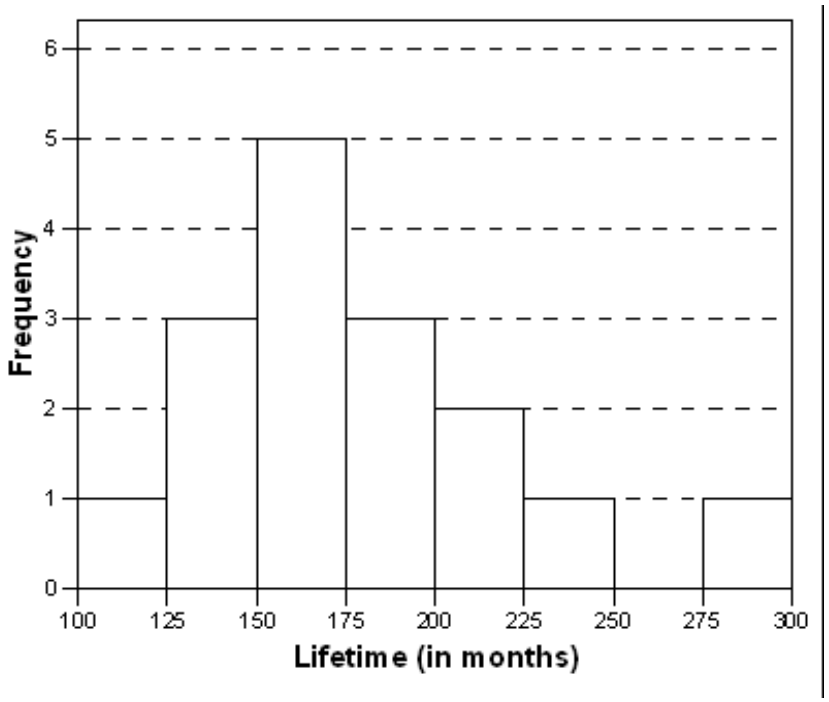


What is approximately the percentage of these winning jumps that were at least 7 feet and1 inch high (85 inches)?

- 9%
- 14%
- 23%
- 35%

55 A consumer agency is testing appliances for a series of articles in their magazine. Currently they are working with cooktops and ranges. They have selected 16 of the most commonly used models. Using a series of tests, the agency will estimate the lifetime of these models. A histogram of these (estimated) lifetimes is shown below.



What is the proportion of these appliances that is estimated to last longer than 15 years?

- More than half
- Less than half
- Equal to 4/16 = 0.25
- It cannot be determined from this graph.

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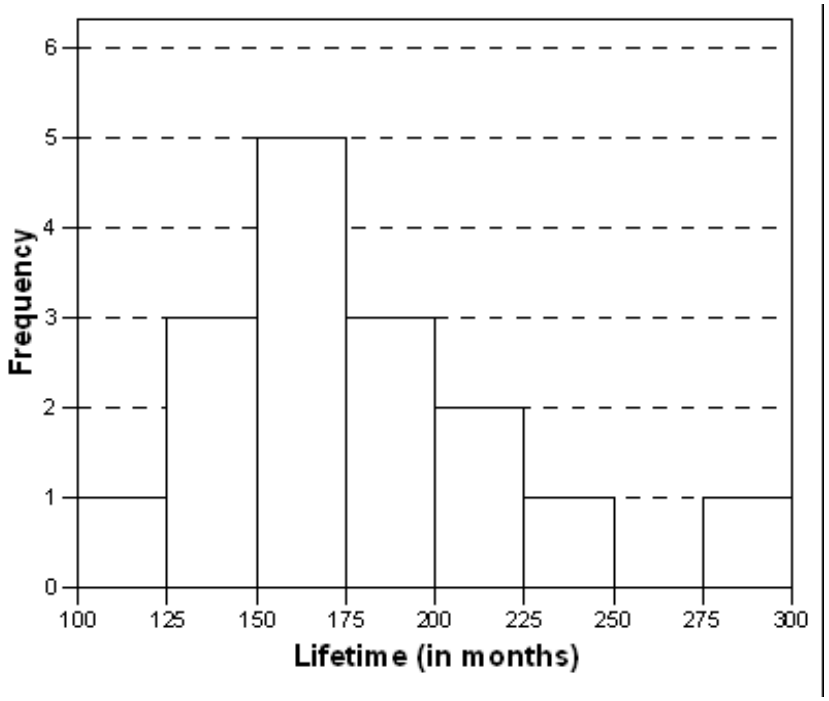

Select all correct descriptions for the shape of the histogram of the estimated lifetimes of these 16 appliances.

Answer:

Unimodal
Skewed right

57 During the early part of the 1994 baseball season, many sports fans and baseball players noticed that the number of home runs being hit seemed to be unusually large. Below are separate stemplots for the number of home runs by American League and National League teams based on the team-by-team statistics on home runs hit through Friday, June 3, 1994 (from the *Columbus Dispatch*, Sunday, June 5, 1994).

American League

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

National League

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

Legend: 2|9 represents 29.

What is the median for the number of home runs for the American League teams?

- 45
- 50
- 50.5

◉ 57.5

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National League

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

Legend: 2|9 represents 29.

Determine whether each of the following statements is true or false.
A) The American League plot is reasonably symmetric.
B) The National League plot is bimodal.
C) The median number of home runs hit by National League teams for this time period was higher than the median for the American League teams.
D) The lowest number of home runs hit by *any* team for this time period is 29.

Answer:

A) True, B) False, C) False, D) True

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Legend: 2|9 represents 29.

What is the mean for the number of home runs for the National League teams?

- 45
- 50
- 50.1
- 57.5

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National League

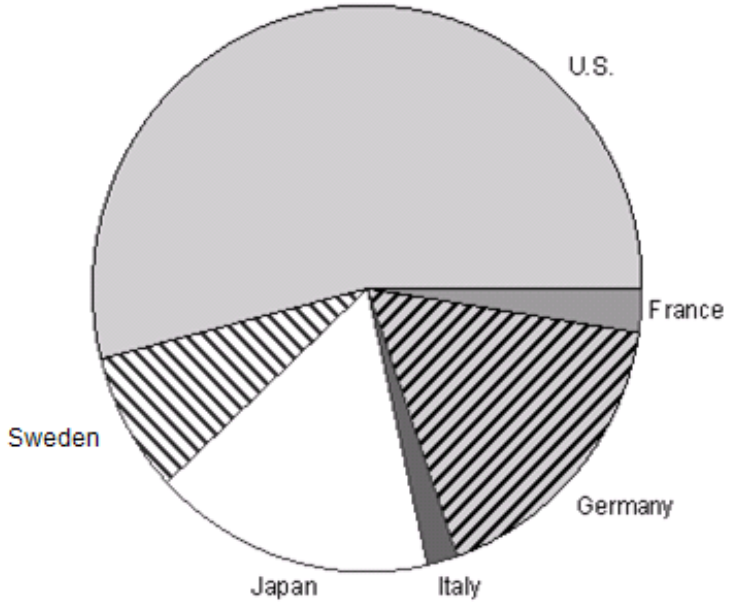
2	9
3	1
4	2 6 7 8 8
5	3 5 5 5
6	3 3 7
7	

Legend: 2|9 represents 29.

What is the maximum number of home runs from a National League team?

- 7
- 70
- 67
- 48

61 The Consumers Union measured the gas mileage in miles per gallon of 38 automobiles from the 1978–1979 model-year on a special test track. The pie chart below provides information about the country of manufacture of the automobiles used in this study by the Consumers Union.



What conclusion can we draw based on this pie chart?

- Italian cars get significantly lower gas mileage than cars of other countries. This is because their slice of the pie is the smallest of the chart.
- More than half of the cars in the study were from the United States.
- Swedish cars get gas mileages that are between those of Japanese and U.S. cars.
- Mercedes-Benz, Audi, Porsche, and BMW represent approximately a quarter of the cars tested.

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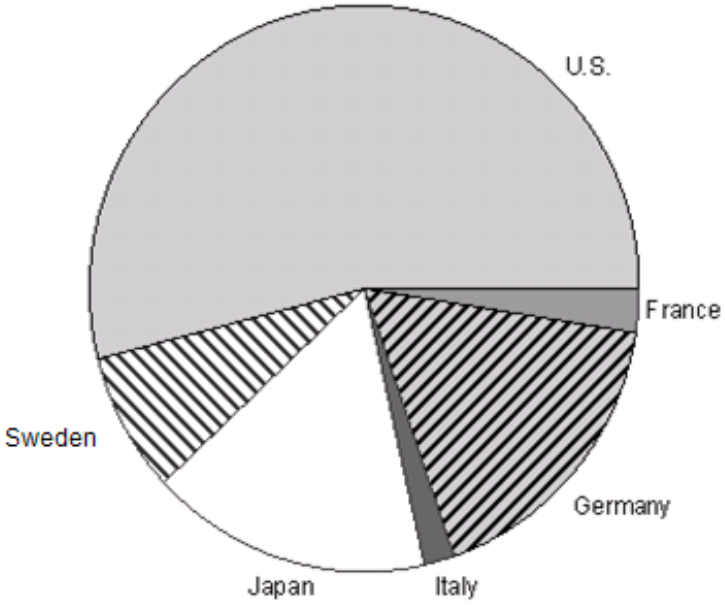
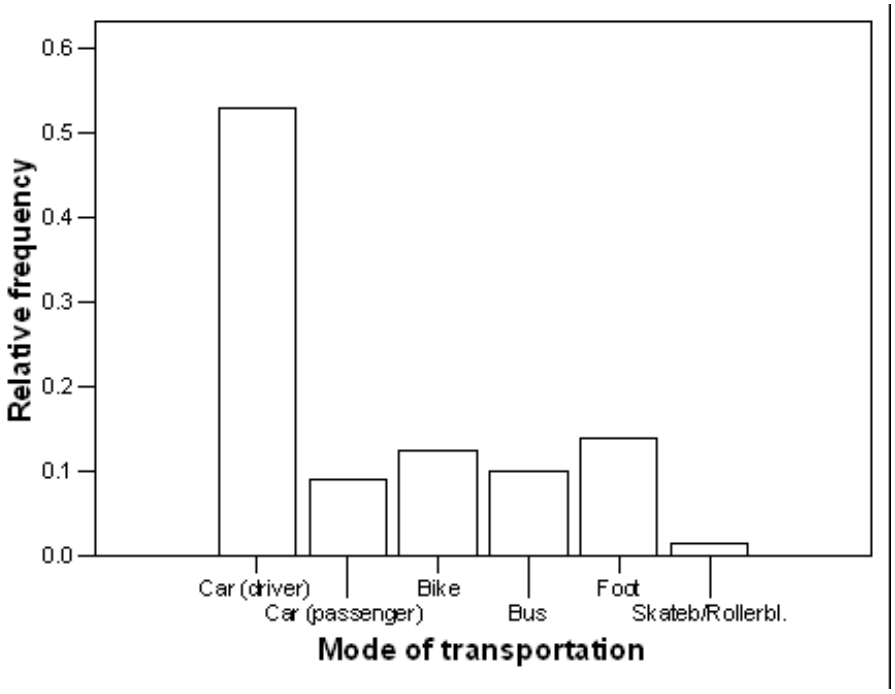


Which of the following bar graphs represents the same data as in the pie chart?

- ○
- ◉
- ○
- ○

63 A study is being conducted on air quality at a small college in the South. As part of this study, monitors were posted at every entrance to this college from 6:00 a.m. to 10:00 p.m. on a randomly chosen day. The monitors recorded the mode of transportation used by each person as they entered the campus. Based on the information recorded, the following bar graph was constructed.



Approximately what percentage of people entering campus on this particular day arrived by car?

- 9%
- 31%
- 53%
- 62%

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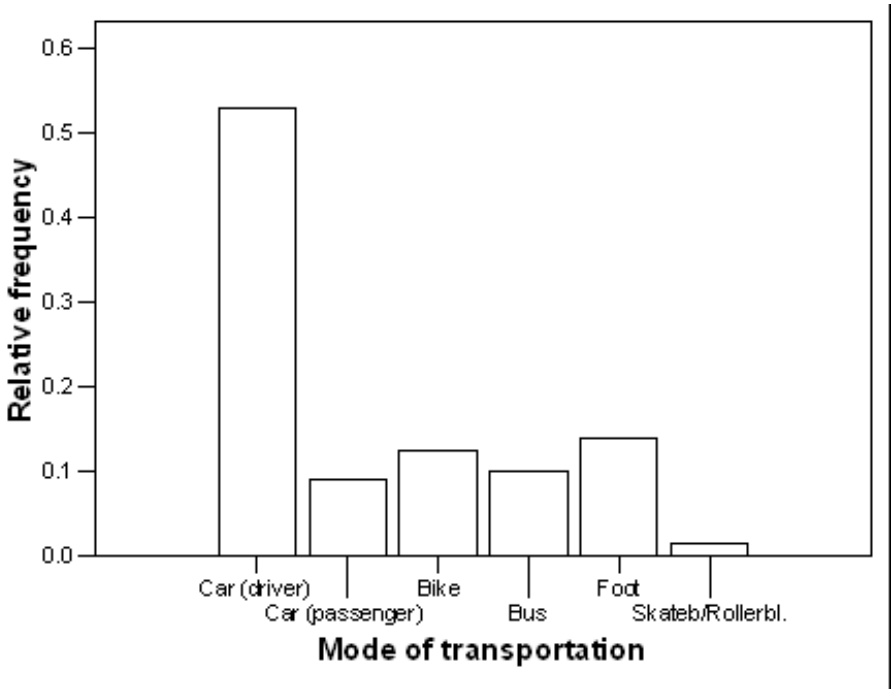
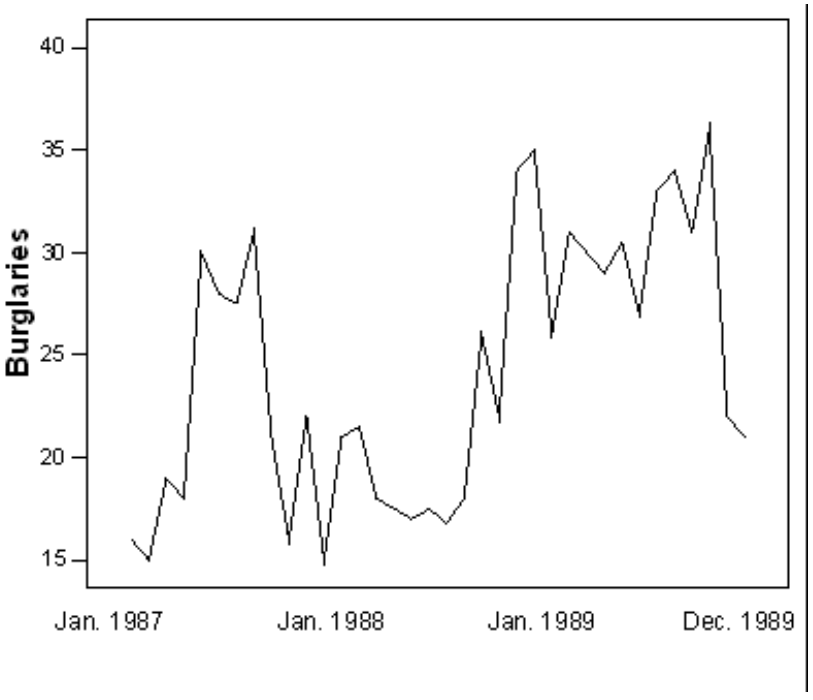


If 1200 people entered campus on this particular day, (approximately) how many people arrived by bus?

- 10
- 100
- 120
- 135

65 The timeplot below gives the number of burglaries committed each month for a city in Ohio. The plot is for the three-year period of January 1987 to December 1989.

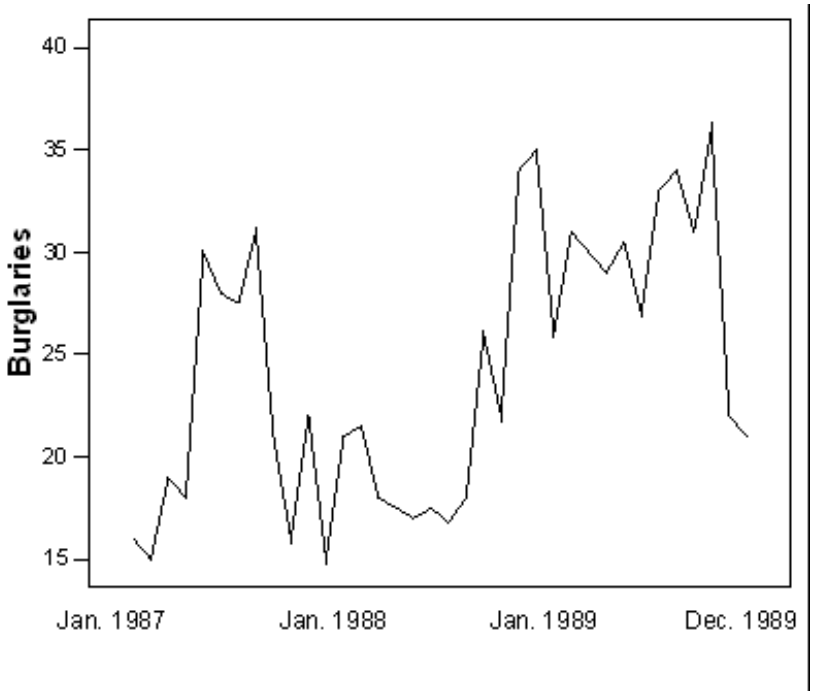


What is approximately the number of burglaries in

December 1989, the last date recorded in the timeplot?

- (•) 22
- ( ) 27
- ( ) 32
- ( ) 37

66 The timeplot below gives the number of burglaries committed each month for a city in Ohio. The plot is for the three-year period of January 1987 to December 1989.



Determine whether each of the following statements is true or false.

A) The number of burglaries in each month of 1988 was lower than the number of burglaries in each month of 1989.

B) The median number of burglaries per month in 1988 was a little over 25.

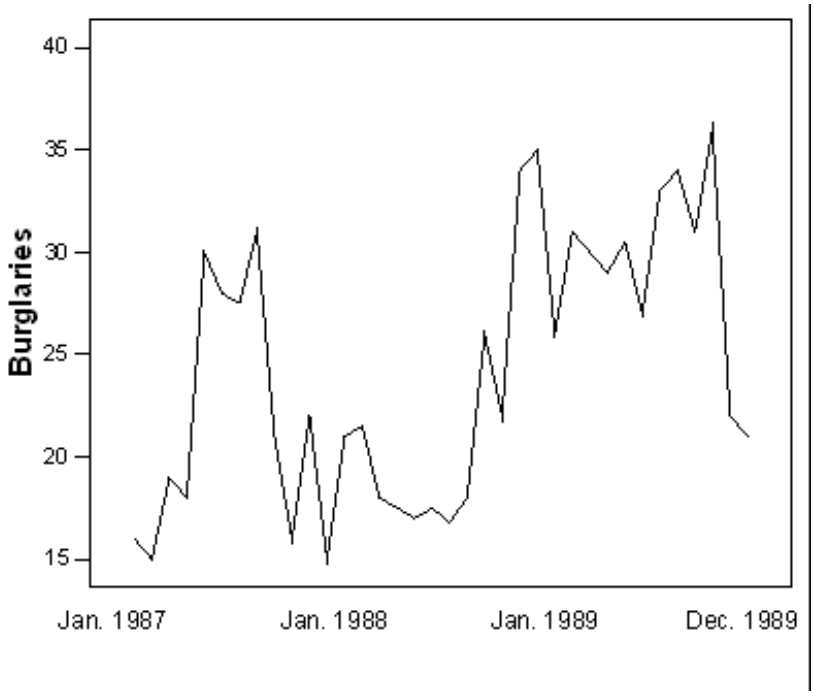
C) The total number of burglaries in 1989 was higher than in 1988.

D) The graph is bimodal.

Answer:

A) False, B) False, C) True, D) False

67 The timeplot below gives the number of burglaries committed each month for a city in Ohio. The plot is for the three-year period of January 1987 to December 1989.



What is approximately the maximum number of burglaries for a month in 1988?

- 20
- 25
- 30
- 35

68 A study of 2007 model automobiles was conducted. In the study the following variables were considered: the **Region** in which the car was manufactured (Europe, North America, Asia); the **Type** of automobile (compact, midsize, large); the fuel economy in city driving of the automobile (**MPG-City**); volume of the engine in liters (**EngSize**); and the type of **Fuel** used (regular, premium, diesel). The variables Region, Type, MPG-City, EngSize, and Fuel are, respectively,

- quantitative, categorical, categorical, quantitative, quantitative.
- categorical, categorical, quantitative, categorical, categorical.
- categorical, categorical, quantitative, categorical, quantitative.
- categorical, categorical, quantitative, quantitative, categorical.
- This cannot be determined without knowing the values of the various variables.

69 Which of the following statements are FALSE?

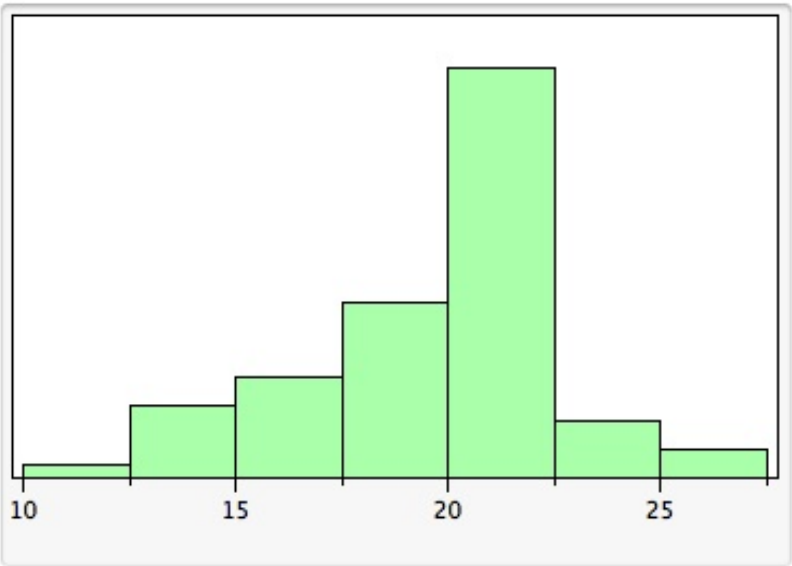
Answer:

A bar chart is a useful graphical tool for describing the *shape* of the distribution of a categorical variable.
A stemplot is particularly valuable for displaying the shape of the distribution of a categorical variable when there are few observations.

70 When examining a distribution of a quantitative variable, which of the following features do we look for?

- ○ Overall shape, center, and spread
- ○ Symmetry or skewness
- ○ Deviations from overall patterns such as outliers
- ○ The number of peaks or modes
- ◉ All of the above

71 In the fuel efficiency study of 2007 compact model automobiles, the following histogram of the distribution of the miles-per-gallon fuel efficiency rating in city driving (MPG-City) for automobiles manufactured in Europe was obtained.



From the histogram above, showing the distribution of MPG-City, we can see that the

- ○ shape of the distribution is roughly symmetric with one peak.
- ◉ distribution is skewed to the left.
- ○ distribution is skewed to the right.
- ○ distribution is roughly symmetric with outlier values to the left.
- ○ shape of the distribution would be easier to see if a stemplot had been constructed instead of the histogram.

72 The following stemplot displays the number of forest fires (in thousands) that occurred each year over the period from

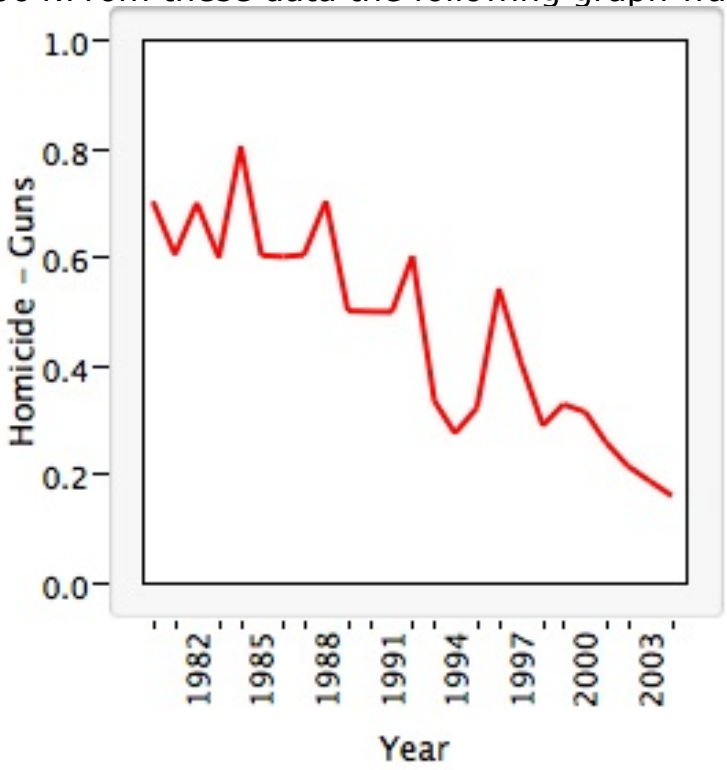
1970 to 2000 in Canada, where 5|2 represents 5200 fires.

5	2
6	0137
7	36
8	0125999
9	11223458
10	111237
11	23
12	2

From the stemplot we can see that

- the shape of the distribution is skewed to the left.
- there appears to be one large peak.
- there was a total of 9 years in which more than 10,000 fires occurred.
- only one year had fewer than 6000 fires.
- All of the above

73 Statistics were gathered on the number of homicides committed with guns in Australia in the years from 1980 to 2004.From these data the following graph was constructed.



This plot is a graph of a(n) _____, and it shows that there is/are _____ in the data.

- categorical variable; skewness to the right
- histogram; multiple peaks
- line; an increasing trend
- quantitative variable; outlier values

- (•) time series; a decreasing trend

74 Which of the following variables is categorical?

- ( ) The number of Facebook friends you have
- ( ) The amount of time a student spends on the Internet in one day
- (•) The available food choices in the student cafeteria
- ( ) None of the above

75 According to the American Cancer Society, the decline in colorectal cancer mortality, primarily attributed to early detection and treatment, has not been consistent among race/ethnic groups. A colorectal exam is one method for early detection of colorectal cancer. In 2008, 29.5% of whites, 56.9% of African Americans, and 62.4% of Hispanics had not received a colorectal exam within the last 10 years. What is the best method to display these data?

- ( ) Histogram
- ( ) Pie chart
- (•) Bar graph
- ( ) Stem-and-leaf plot

76 Malaria is a leading cause of infectious disease and death worldwide. The table below represents the mean number of reported malaria cases (between 1996 and 2006) for each of 10 West African countries, as published in the journal *Statistica Neerlandica*.

Country	Mean number of reported malaria cases
Benin	745,340
Burkina Faso	1,098,680
Cote d'Ivoire	1,203,705
The Gambia	229,505
Ghana	2,956,957
Liberia	613,171
Mali	691,245
Senegal	1,111,249
Sierra Leone	321,340
Togo	453,837

What is the best method to display these data?

- ( ) Histogram
- ( ) Pie chart
- (•) Bar graph
- ( ) Stem-and-leaf plot

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Liberia	613,171
Mali	691,245
Senegal	1,111,249
Sierra Leone	321,340
Togo	453,837

True or False. The variable "country" is a quantitative variable.

- ○ True
- ◉ False

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Sierra Leone	321,340
Togo	453,837

True or False. Making a histogram of the data would tell us if the distribution of the malaria data is symmetric.

- ○ True
- ◉ False

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worldwide. The table below represents the mean number of reported malaria cases (between 1996 and 2006) for each of 10 West African countries, as published in the journal *Statistica Neerlandica*.

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Sierra Leone	321,340
Togo	453,837

Why is it not appropriate to use a histogram to display these data?

- A pie chart is much easier to read.
- The data are categorical and therefore a histogram is not appropriate.
- The width of the bins would be too large to display a histogram.
- None of the above

80 The World Malaria Report (2008) has information on the number of reported malaria cases from 2005 and 2006 for the 10 countries listed in West Africa. The data are presented in the table below.

Country/area	2005	2006
Benin	803,462	861,847
Burkina Faso	1,615,695	2,060,867
Côte d'Ivoire	1,280,914	1,253,408
Gambia	161,698	266,188
Ghana	3,452,969	3,511,452
Liberia	116,681	1,105,272
Mali	962,706	1,022,592
Senegal	1,346,158	1,555,310
Sierra Leone	233,833	160,666
Togo	437,662	566,450

The mean of the reported West African malaria cases in 2005 is _____.

- less than 116,698

- greater than 1,600,000
- 100,000
- (•) greater than 200,000

81 The World Malaria Report (2008) has information on the number of reported malaria cases from 2005 and 2006 for the 10 countries listed in West Africa. The data are presented in the table below.

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Benin	803,462	861,847
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Senegal	1,346,158	1,555,310
Sierra Leone	233,833	160,666
Togo	437,662	566,450

The median of the reported malaria cases in 2005 is _____.

- (•) less than 1,000,000
- less than 200,000
- 100,000
- 3,000,000

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Senegal	1,346,158	1,555,310
Sierra Leone	233,833	160,666
Togo	437,662	566,450

The mean reported malaria cases in 2006 is _____.

- (•) less than 2,000,000
- ( ) less than 200,000
- ( ) 100,000
- ( ) 3,000,000

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Senegal	1,346,158	1,555,310
Sierra Leone	233,833	160,666
Togo	437,662	566,450

The mean of the reported West African malaria cases in 2005 is _____.

- (•) around 1,000,000
- ( ) less than 200,000
- ( ) 100,000
- ( ) 3,000,000

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Senegal	1,346,158	1,555,310
Sierra Leone	233,833	160,666
Togo	437,662	566,450

The mean number of malaria cases in 2006 is probably _____.

- (•) higher than in 2005
- ( ) lower than in 2005
- ( ) exactly the same as in 2005

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Mali	962,706	1,022,592
Senegal	1,346,158	1,555,310
Sierra Leone	233,833	160,666
Togo	437,662	566,450

If the number of reported malaria cases in Ghana in 2005 were mistyped and reported as 30,452,969, what would happen to the mean and median?

- ( ) Both would remain unchanged.
- (•) The mean would change, but the median would stay the same.
- ( ) The mean and median would change.
- ( ) You cannot tell without doing the actual calculation.

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Senegal	1,346,158	1,555,310

Sierra Leone	233,833	160,666
Togo	437,662	566,450

If the number of reported malaria cases in Sierra Leone were mistyped and reported as 1,160,666, what would happen to the mean and median?

- ○ Both would remain unchanged.
- ○ The mean would change, but the median would stay the same.
- ◉ The mean and median would change.
- ○ You cannot tell without doing the actual calculation.

87 The World Malaria Report (2008) has information on the number of reported malaria cases from 2005 and 2006 for the 10 countries listed in West Africa. The data are presented in the table below.

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Senegal	1,346,158	1,555,310
Sierra Leone	233,833	160,666
Togo	437,662	566,450

If the number of malaria cases for Ghana were removed from this data set, what would happen to the mean of the entire data set for the year 2005?

- ○ The mean would not change.
- ◉ The mean would change.
- ○ You cannot tell without doing the calculation.

88 The World Malaria Report (2008) has information on the number of reported malaria cases from 2005 and 2006 for the 10 countries listed in West Africa. The data are presented in the table below.

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Togo	437,662	566,450

If the number of malaria cases for Sierra Leone were removed from this data set, what would happen to the mean of the entire data set for the year 2006?

- The mean would not change.
- (•) The mean would change.
- You cannot tell without doing the calculation.

89 Which of the following variables is quantitative?

- The amount of time a student spends on the Internet in a week
- The number of tenured professors at a large university
- The number of hurricanes each year for the years 2000 to 2010
- (•) All of the above
- None of the above

90 The National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC; http://www7.ncdc.noaa.gov) collects several weather variables. Identify whether each of the listed variables from the NCDC are quantitative or categorical.
A) The amount of rainfall in 1 year in every state
B) The mean temperature in California across 25 years
C) The number of days with precipitation of at least 1 millimeter
D) The departure of precipitation from the average
Answer:

A) Quantitative, B) Quantitative, C) Quantitative, D) Quantitative

91 On the first day of class, statistics professors ask each student to fill out a demographic questionnaire to learn information about their class. Which of the following variables is/are categorical?

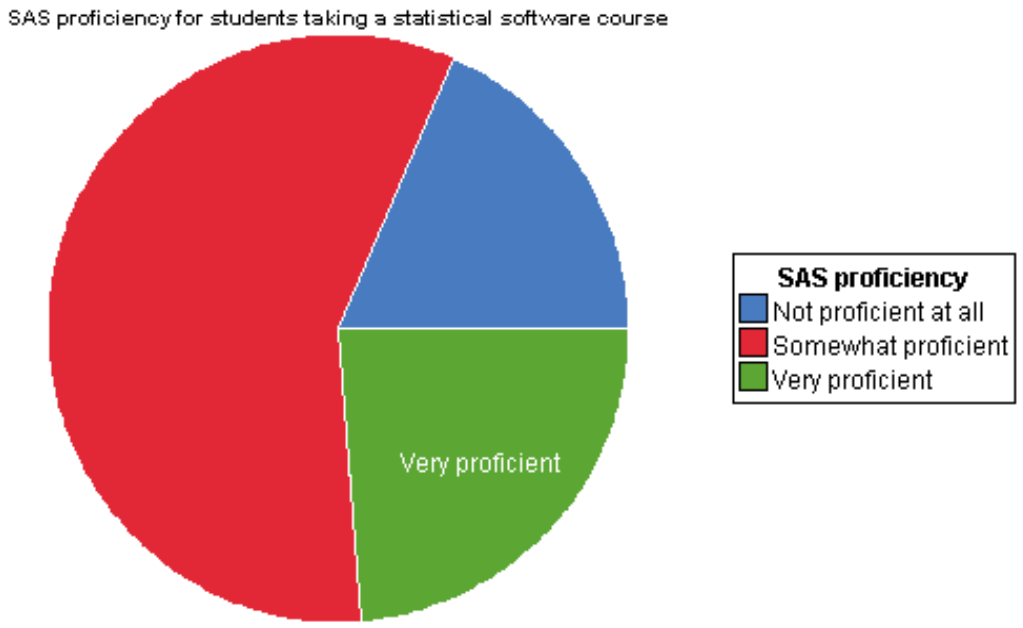
- Gender
- Marital status
- Highest education level of your mother (e.g., high school grad, college grad, etc.)
- (•) All of the above

- None of the above

92 On the first day of class, statistics professors ask each student to fill out a demographic questionnaire to learn information about their class. Which of the following variables is/are quantitative?

- Gender
- Marital status
- Highest education level of your mother (e.g., high school grad, college grad, etc.)
- Household income

93 A nationwide study was done to assess the programming proficiency of students taking a statistical programming class. The students were asked their proficiency in the statistical software SAS. The survey was sent to students at over 100 universities and 112 responses were received from 21 different universities. The results were published in the journal *International Mathematical Forum*. The results in the form of a pie chart are shown below.



From the pie chart, we can see that most students are _____.

- not proficient at all
- somewhat proficient
- very proficient

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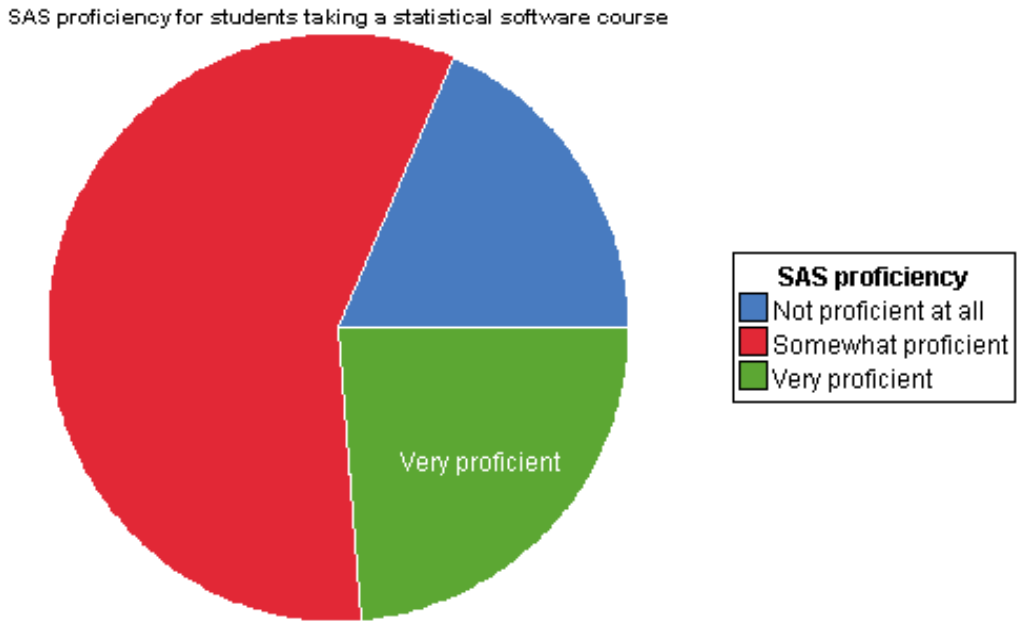
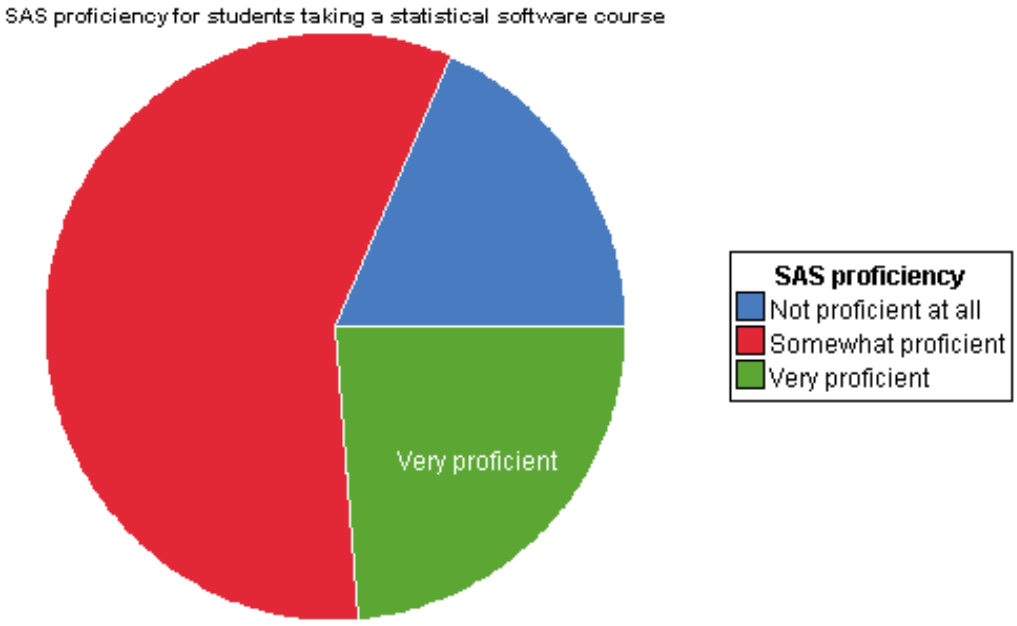


It would have been better to display the data in a histogram.

- True
- False
- Both displays work equally well.

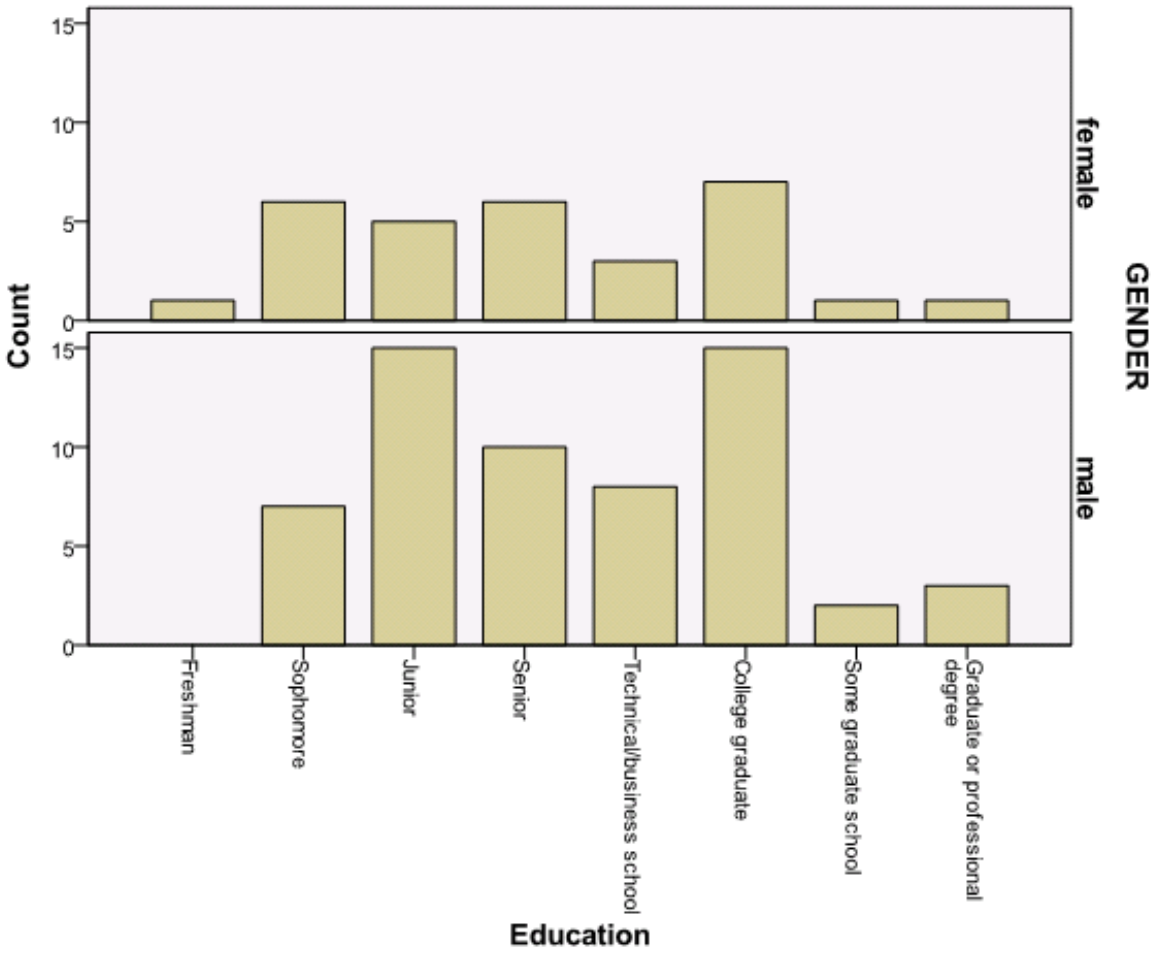
95 A nationwide study was done to assess the programming proficiency of students taking a statistical programming class. The students were asked their proficiency in the statistical software SAS. The survey was sent to students at over 100 universities and 112 responses were received from 21 different universities. The results were published in the journal *International Mathematical Forum*. The results in the form of a pie chart are shown below.



True or False. A bar graph would give the same information?

- (•) True
- ( ) False

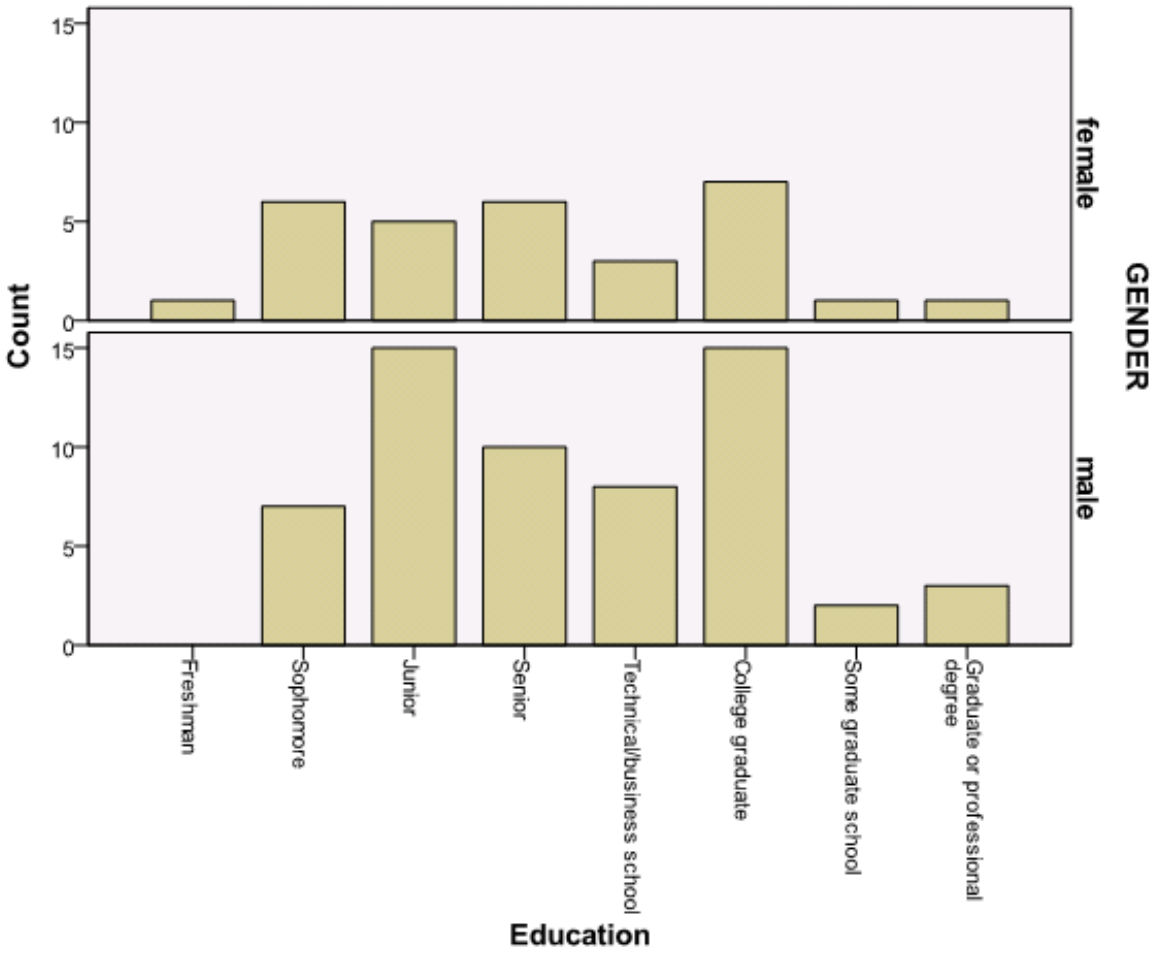
96 The bar graph below represents the highest education level achieved for 30 random females and 60 random males questioned on a street in downtown Washington, DC.



Approximately how many people are college graduates?

- 15
- 7
- 22
- 1

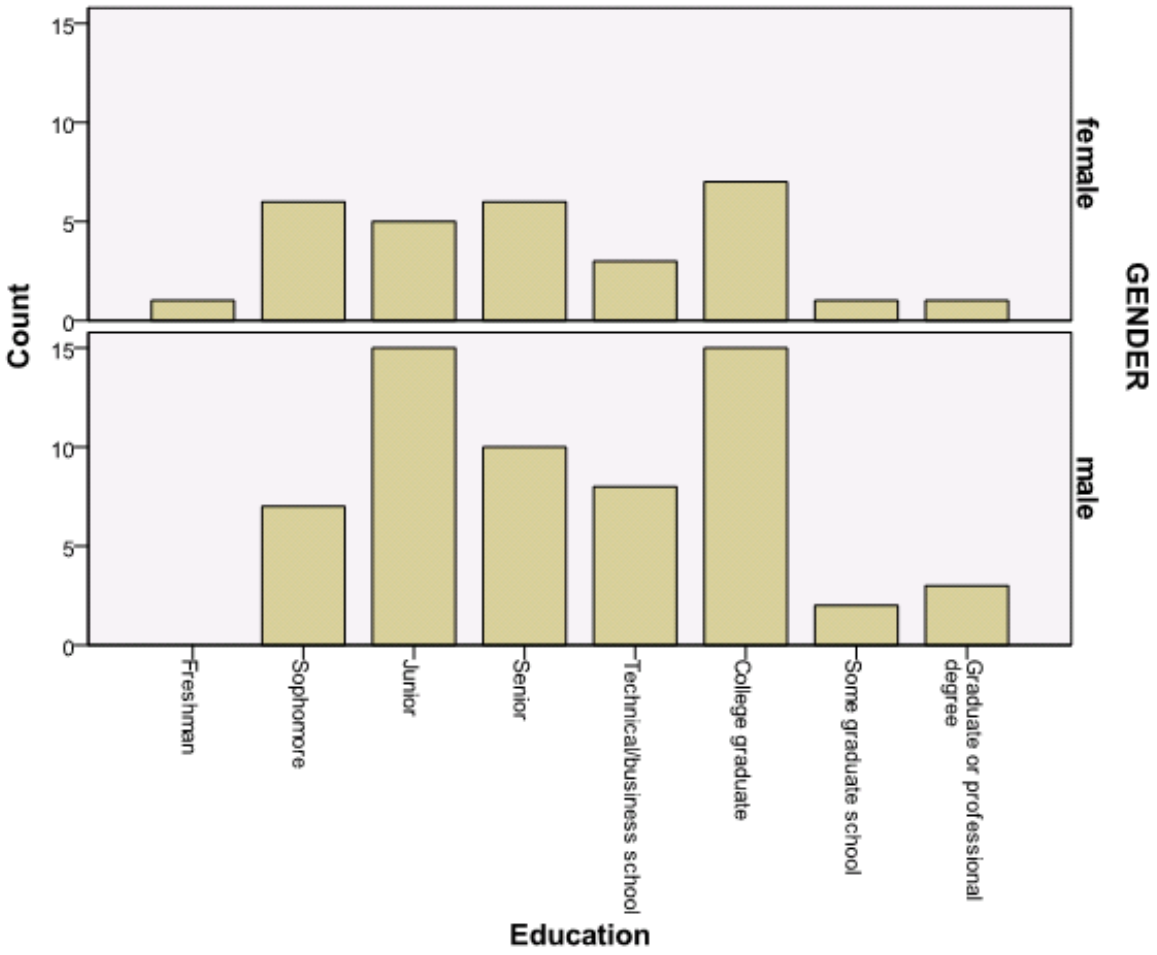
97 The bar graph below represents the highest education level achieved for 30 random females and 60 random males questioned on a street in downtown Washington, DC.



More men than women are college graduates.

- (•) True
- ( ) False
- ( ) This cannot be determined from the information given.

98 The bar graph below represents the highest education level achieved for 30 random females and 60 random males questioned on a street in downtown Washington, DC.



What percentage of women completed at most their junior year?

- 5%
- 17%
- 67%
- 100%

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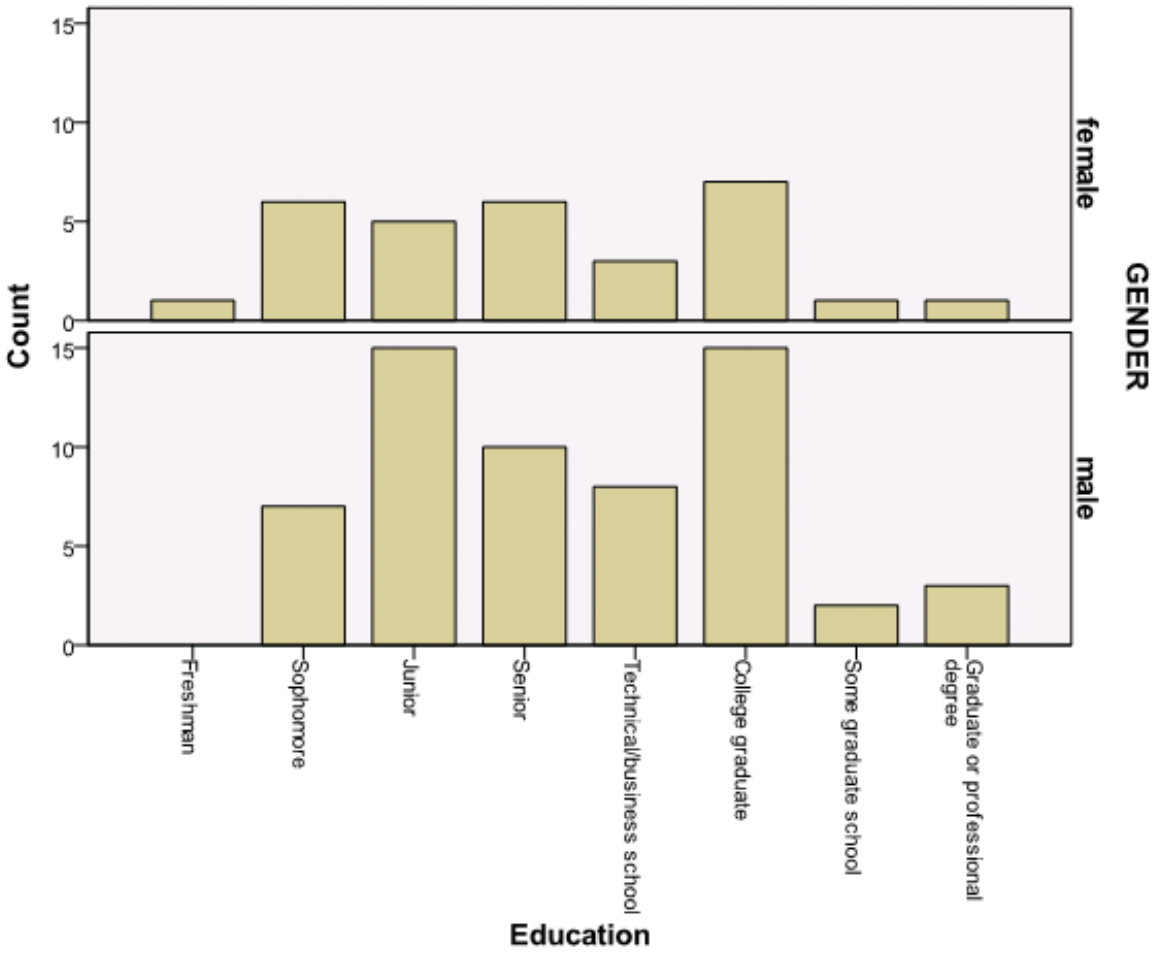
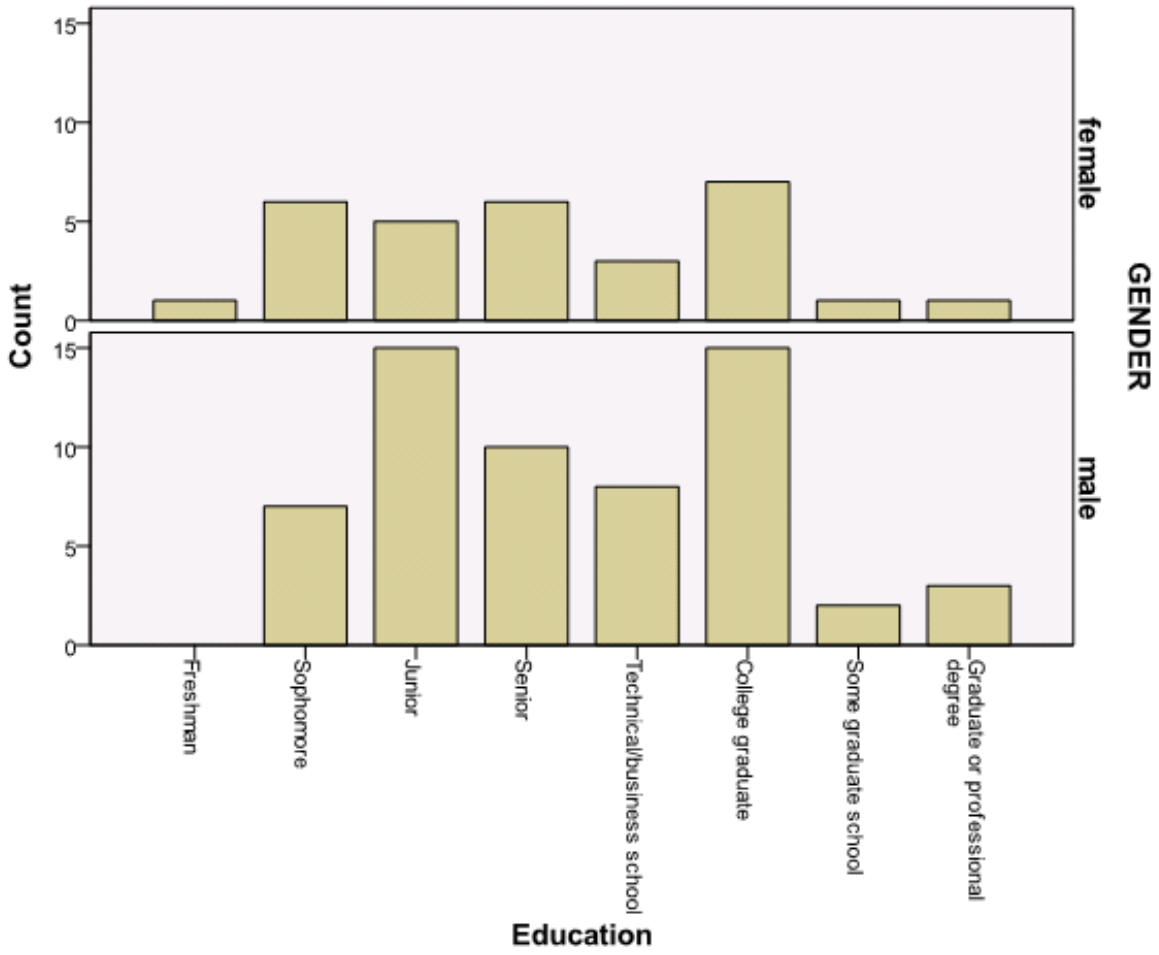


What percentage of men completed at most their freshman year?

- 1%
- 100%
- 0%
- This cannot be determined from the information given.

100 The bar graph below represents the highest education level achieved for 30 random females and 60 random males questioned on a street in downtown Washington, DC.



How many males completed at least some graduate school?

- 5
- 2
- 3
- 60

101 A consumer group surveyed the prices for cotton, extra-long twin-sheet sets in five different department stores and reported the average price as $16.We visited four of the five stores and found the prices to be $12, $15, $17, and $22. Assuming that the consumer group is correct, what is the price of the item at the store that we did not visit?

- $10
- $14
- $15
- $17

102 The average salary of all female workers is $35,000.The average salary of all male workers is $41,000.What must be true about the average salary of all workers?

- It must be $38,000.
- It must be larger than the median salary.

- (●) It could be any number between $35,000 and $41,000.
- ( ) It must be larger than $38,000.

103 A researcher reports that, on average, the participants in his study lost 10.4 pounds after 2 months on his new diet. A friend of yours comments that she tried the diet for 2 months and lost no weight, so clearly the report must be a fraud. Which of the following statements is correct?

- ( ) Your friend must not have followed the diet correctly because she did not lose weight.
- ( ) Because your friend did not lose weight, the report must not be correct.
- (●) The report gives only the average. This does not imply that all participants in the study lost 10.4 pounds or even that all participants lost weight. Your friend's experience does not necessarily contradict the study results.
- ( ) In order for the study to be correct, we must now add your friend's results to those of the study and recalculate the new average.

104 The ages (to the nearest year) of the 667 people participating in a large workshop are summarized as shown below.

Age	18	19	20	21	22	23	24	25	32
Number of students	14	120	200	200	90	30	10	2	1

What is true about the median age?

- ( ) It could be any number between 19 and 20.
- (●) It must be 20.
- ( ) It must be 21.
- ( ) It must be over 21.

105 As part of a large ongoing study on the treatment of women with breast cancer, the treatment time (in months) of eight patients whose lymph nodes were cancer-free is recorded. Treatment time is defined as the time from the moment the cancer treatment starts until the patient is declared cancer-free.

9.47 8.60 19.33 16.33 8.50 9.40 17.67 9.30

What is the mean treatment time for these eight women?

- ( ) 10.5 months
- ( ) 11.67 months
- (●) 12.325 months
- ( ) 15 months

106 The median age of five people in a meeting is 30 years.

One of the people, whose age is 50 years, leaves the room. What is the median age of the remaining four people in the room?

- 40 years
- 30 years
- 25 years
- This cannot be determined from the information given.

107 The Environmental Protection Agency records data on the fuel economy of many different makes of cars. Some of the variables they collect are listed below. Identify each variable as categorical or quantitative.
A) Manufacturer of the car (Nissan, Ford, Toyota, etc.)
B) Mileage of the car (miles per gallon)
C) Weight of the car (in pounds)
D) Size of the car (small, medium, full-size, pick-up truck, etc.)
Answer:

A) Categorical, B) Quantitative, C) Quantitative, D) Categorical

108 The Environmental Protection Agency records data on the fuel economy of many different makes of cars. Data on the mileage of 20 randomly selected cars are listed below. The values are ordered for convenience.

12	13	15	16	16	17	18	18	19	19
20	20	22	23	24	26	26	27	27	29

What is the median mileage for these 20 cars?

- 17.5 miles per gallon
- 19 miles per gallon
- 19.5 miles per gallon
- 20 miles per gallon

109 The Environmental Protection Agency records data on the fuel economy of many different makes of cars. Data on the mileage of 20 randomly selected cars are listed below. The values are ordered for convenience.

12	13	15	16	16	17	18	18	19	19
20	20	22	23	24	26	26	27	27	29

If the value 29 were misrecorded and should really be 21, what would the median mileage be for these 20 cars?

- It would change to 20 miles per gallon.
- It would stay the same.
- It would change to 21 miles per gallon.

- We cannot determine this from the given information.

110 The Environmental Protection Agency records data on the fuel economy of many different makes of cars. Data on the mileage of 20 randomly selected cars are listed below. The values are ordered for convenience.

12	13	15	16	16	17	18	18	19	19
20	20	22	23	24	26	26	27	27	29

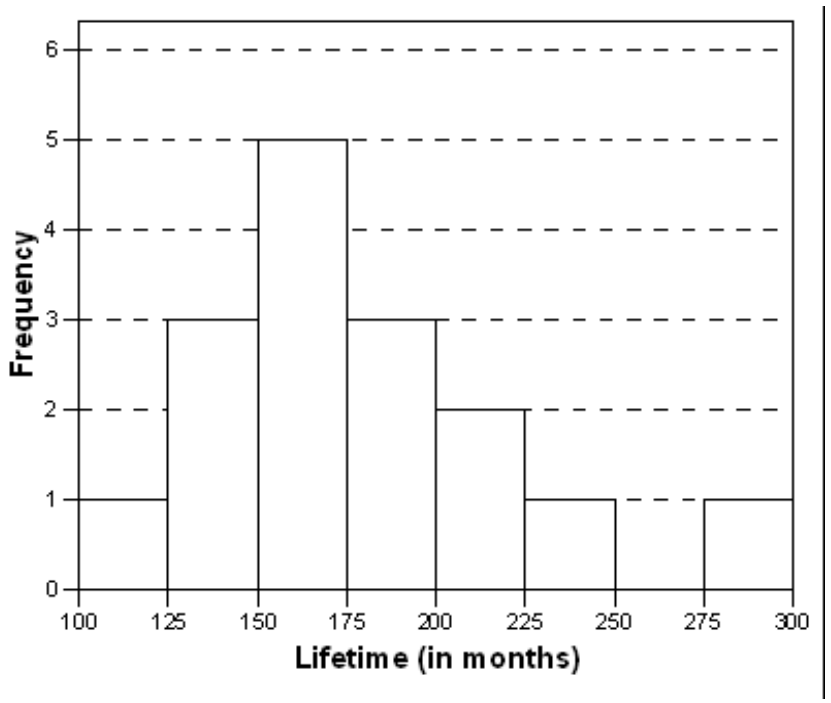
What is the interquartile range for the mileage data?

- (•) 8.5 miles per gallon
- ( ) 16.5 miles per gallon
- ( ) 17 miles per gallon
- ( ) 25 miles per gallon

111 A set of midterm exam scores 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 would be symmetric.
- (•) A stemplot of the data would be skewed left.
- ( ) A stemplot of the data would be skewed right.
- ( ) The data set must be so large that it would be better to draw a histogram rather than a stemplot.

112 A consumer agency is testing appliances for a series of articles in their magazine. Currently they are working with cooktops and ranges. They have selected 16 of the most commonly used models. Using a series of tests, the agency will estimate the lifetime of these models. A histogram of these (estimated) lifetimes is shown below.



Answer each of the following questions with yes, no, or can't tell.

A) Is the shortest lifetime in this data set equal to 100 months?

B) Is the median lifetime in this data set somewhere between 150 and 175 months?

C) Is the range of this data set equal to 200 months?

D) Is it possible that all of these 16 appliances had estimated lifetimes that were longer than 10 years?

Answer:

A) Can't tell, B) Yes, C) Can't tell, D) Yes

113 Which of the following is likely to have a mean that is smaller than the median?

- ○ The salaries of all National Football League players
- ◉ The scores of students (out of 100 points) on a very easy exam in which most score perfectly but a few do very poorly
- ○ The number of text messages sent by students and faculty at a large university
- ○ The scores of students (out of 100 points) on a very difficult exam on which most score poorly but a few do very well

114 The salaries of Major League Baseball players range from several hundred thousand dollars per year to many millions per year. Suppose a histogram is made of all last year's salaries of Major League Baseball players. Which shape would best describe the shape of this histogram?

- ○ Skewed to the left
- ○ Bell-shaped
- ◉ Skewed to the right
- ○ Bimodal

115 A reporter wishes to portray baseball players as overpaid. Which measure of center should he report as the *average* salary of major league players?

- ◉ The mean
- ○ The median
- ○ Either the mean or median—they will be equal in this case.
- ○ Neither the mean nor the median—both will be much lower than the actual average salary.

116 The Insurance Institute for Highway Safety publishes data on the total damage suffered by compact automobiles in a series of controlled, low-speed collisions. The cost for a

sample of nine cars, in hundreds of dollars, is provided below

10 6 8 10 4 3.5 7.5 8 9

What is the median cost of the total damage suffered for this sample of cars?

- $400
- $730
- $800
- $1000

117 The Insurance Institute for Highway Safety publishes data on the total damage suffered by compact automobiles in a series of controlled, low-speed collisions. The cost for a sample of nine cars, in hundreds of dollars, is provided below

10 6 8 10 4 3.5 7.5 8 9

What is the first quartile for the above data?

- $350
- $500
- $600
- None of the above

118 The Insurance Institute for Highway Safety publishes data on the total damage suffered by compact automobiles in a series of controlled, low-speed collisions. The cost for a sample of nine cars, in hundreds of dollars, is provided below

10 6 8 10 4 3.5 7.5 8 9

What is the interquartile range of the above data?

- A value less than $200
- A value between $200 and $460
- A value between $460 and $800
- None of the above

119 The Insurance Institute for Highway Safety publishes data on the total damage suffered by compact automobiles in a series of controlled, low-speed collisions. The cost for a sample of nine cars, in hundreds of dollars, is provided below

10 6 8 10 4 3.5 7.5 8 9

What is the mean of the total damage suffered for this

sample of cars?

- $239
- $733
- $800
- $950

120 The Insurance Institute for Highway Safety publishes data on the total damage suffered by compact automobiles in a series of controlled, low-speed collisions. The cost for a sample of nine cars, in hundreds of dollars, is provided below

10 6 8 10 4 3.5 7.5 8 9

Using the correct units, what is the value of the variance?

- 224.85 dollars
- 238.48 dollars2
- 50,555.54 dollars2
- 56,875 dollars2

121 During the early part of the 1994 baseball season, many sports fans and baseball players noticed that the number of home runs being hit seemed to be unusually large. The numbers of home runs by American League and National League teams based on the team-by-team statistics on home runs hit through Friday, June 3, 1994, are given below (from the *Columbus Dispatch*, Sunday, June 5, 1994).

American League
35 40 43 49 51 54 57 58 58 64
68 68 75 77

National League
29 31 42 46 47 48 48 53 55 55
55 63 63 67

What is the mean number of home runs hit by American League teams?

- 48.5
- 56.9
- 57.5
- 58.1

122 During the early part of the 1994 baseball season, many sports fans and baseball players noticed that the number of home runs being hit seemed to be unusually large. The numbers of home runs by American League and National League teams based on the team-by-team statistics on

home runs hit through Friday, June 3, 1994, are given below (from the *Columbus Dispatch*, Sunday, June 5, 1994).

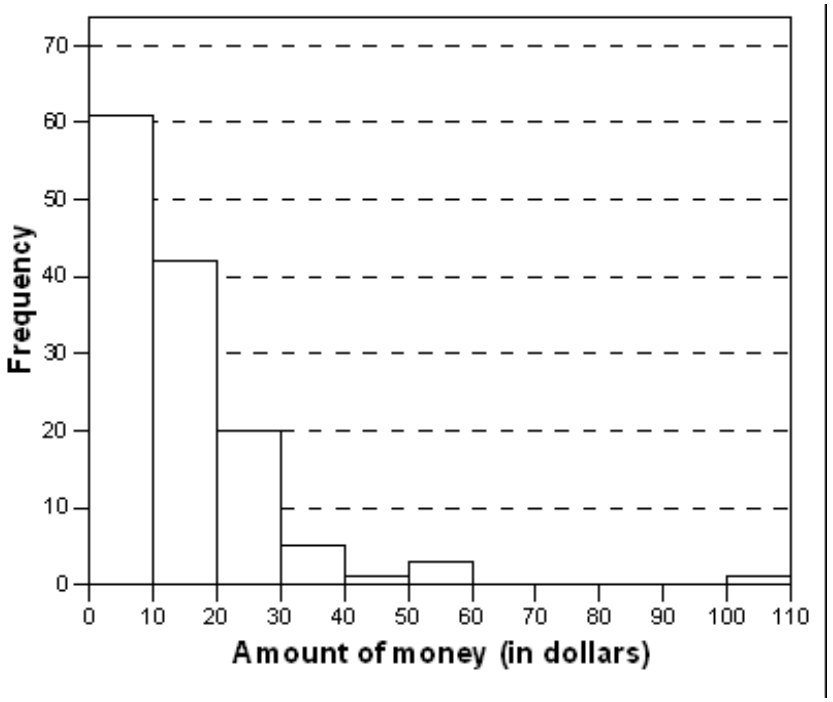
American League
35 40 43 49 51 54 57 58 58 64
68 68 75 77

National League
29 31 42 46 47 48 48 53 55 55
55 63 63 67

The mean and standard deviation of the number of home runs hit by National League teams are 50 and 11, respectively. Suppose we wish to measure how many more home runs than last year's average of 40 these teams have had this year by subtracting 40 from each number (a team with 55 home runs has 55 – 40 = 15 more home runs than last year's average). What are the mean and standard deviation of these new numbers?

- 50 and 11
- 10 and 11
- 50 and –29
- 10 and –29

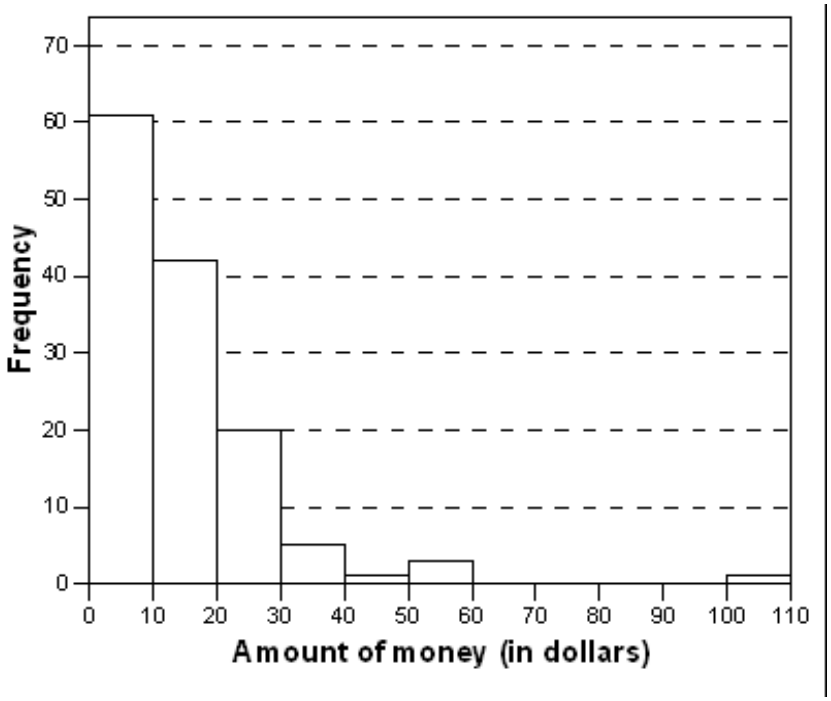
123 In a statistics class with 136 students, the professor records how much money each student has in their possession during the first class of the semester. The histogram shown below represents the data he collected.



From the histogram, which of the following is TRUE?

- (●) The mean is larger than the median.
- ( ) The mean is smaller than the median.
- ( ) The mean and median are approximately equal.
- ( ) It is impossible to compare the mean and median for these data.

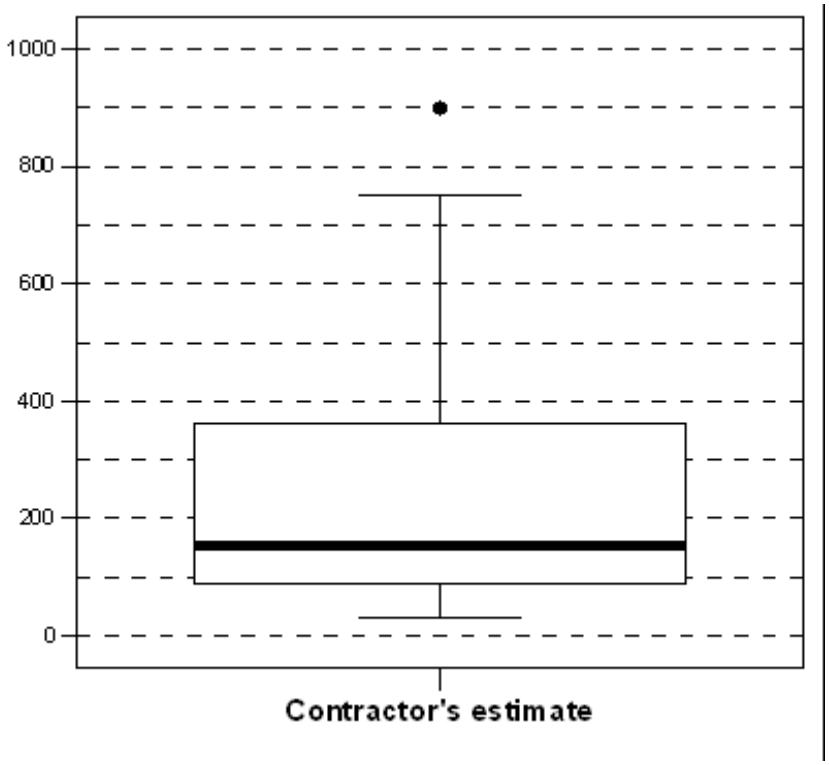
124 In a statistics class with 136 students, the professor records how much money each student has in their possession during the first class of the semester. The histogram shown below represents the data he collected.



What is the range of the data set?

- ( ) 90
- ( ) 100
- ( ) 110
- (●) This cannot be determined from just the histogram.

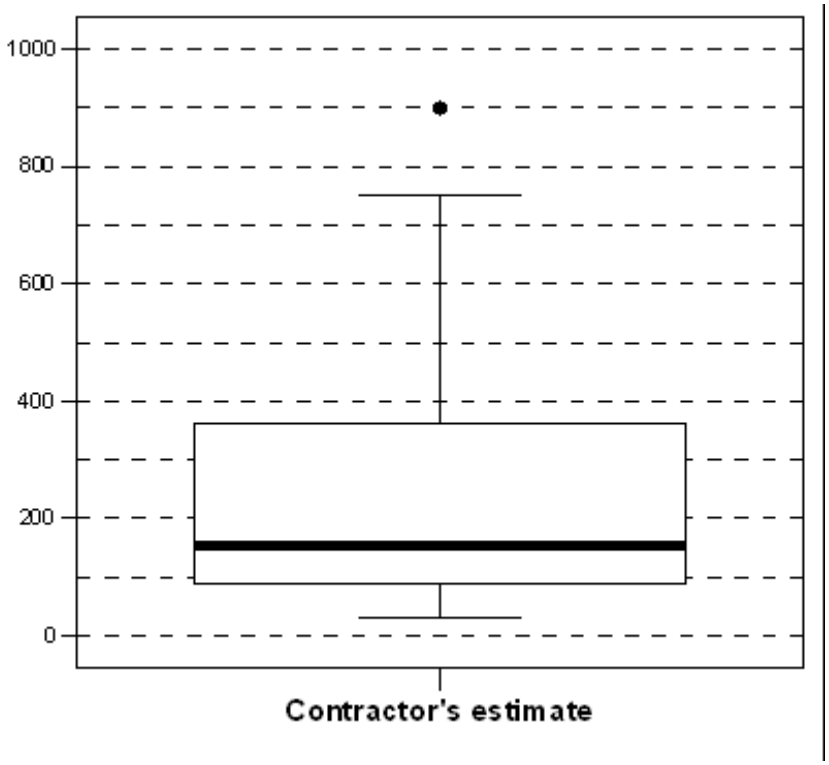
125 The Michigan Department of Transportation (M-DOT) is working on a major project: 80% of the highways in Michigan need to be repaved. To speed completion of this project, many contractors will be working for M-DOT. Contractors are currently bidding on the next part of the project. To help make a decision about which contractor to hire, M-DOT collects many variables besides just the estimated cost. One of those variables is the contractor's estimate of the number of workdays required to finish the job. Twenty contractors have bid on the next job. The boxplot below represents their estimates of the number of work days required.



What is (approximately) the interquartile range, based on the boxplot?

- 140 days
- 270 days
- 360 days
- 760 days

126 The Michigan Department of Transportation (M-DOT) is working on a major project: 80% of the highways in Michigan need to be repaved. To speed completion of this project, many contractors will be working for M-DOT. Contractors are currently bidding on the next part of the project. To help make a decision about which contractor to hire, M-DOT collects many variables besides just the estimated cost. One of those variables is the contractor's estimate of the number of workdays required to finish the job. Twenty contractors have bid on the next job. The boxplot below represents their estimates of the number of work days required.



Determine whether each of the following statements is true or false.

A) The median number of days is approximately 180.

B) The minimum number of days is approximately 40.

C) The maximum number of days is approximately 750.

D) Twenty-five percent of contractors estimated the number of days to be more than 100.

Answer:

A) True, B) True, C) False, D) False

127 The asking prices (in thousands of dollars) for a sample of 13 houses currently on the market in Neighborville are listed below. For convenience, the data have been ordered.

175 199 205 234 259 275 299 304 317 345 355 384 549

What is the five-number summary?

- 175 234 299 331 549
- 199 219.5 299 350 549
- 175 219.5 299 350 384
- None of the above

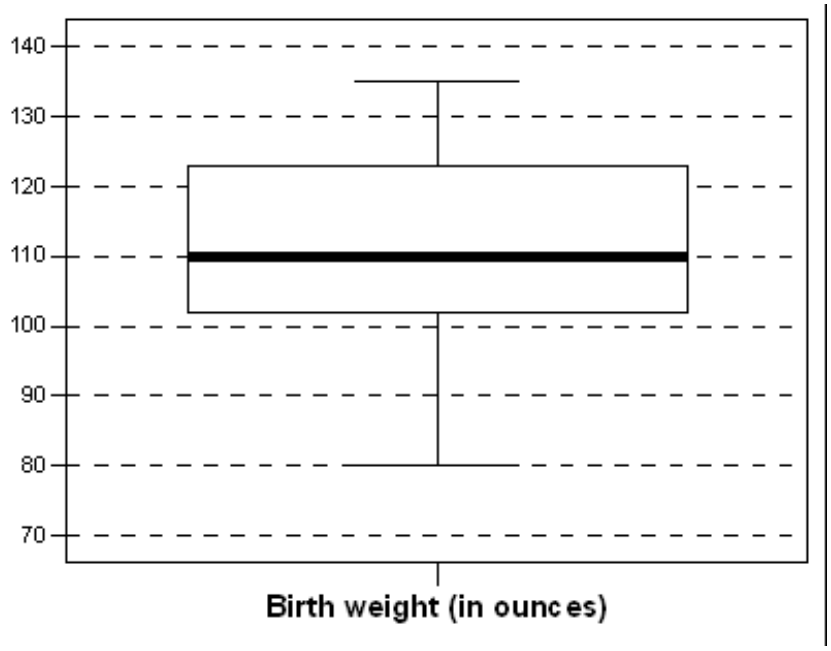
128 The asking prices (in thousands of dollars) for a sample of 13 houses currently on the market in Neighborville are listed below. For convenience, the data have been ordered.

175 199 205 234 259 275 299 304 317 345 355 384 549

Use the 1.5 × *IQR* rule to determine if there are any outliers present. What is/are the value(s) of the outlier(s)?

- There are no outliers present.
- One outlier: 175
- One outlier: 549
- Two outliers: 175 and 549

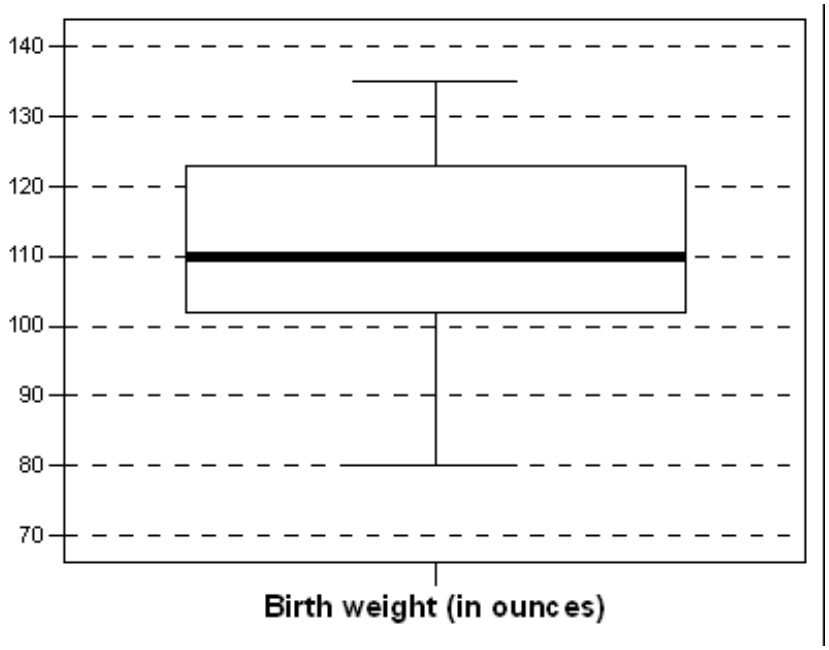
129 The following boxplot is of the birth weights (in ounces) of 160 infants born in a local hospital.



The median birth weight is approximately _____.

- 90 ounces
- 100 ounces
- 110 ounces
- 120 ounces

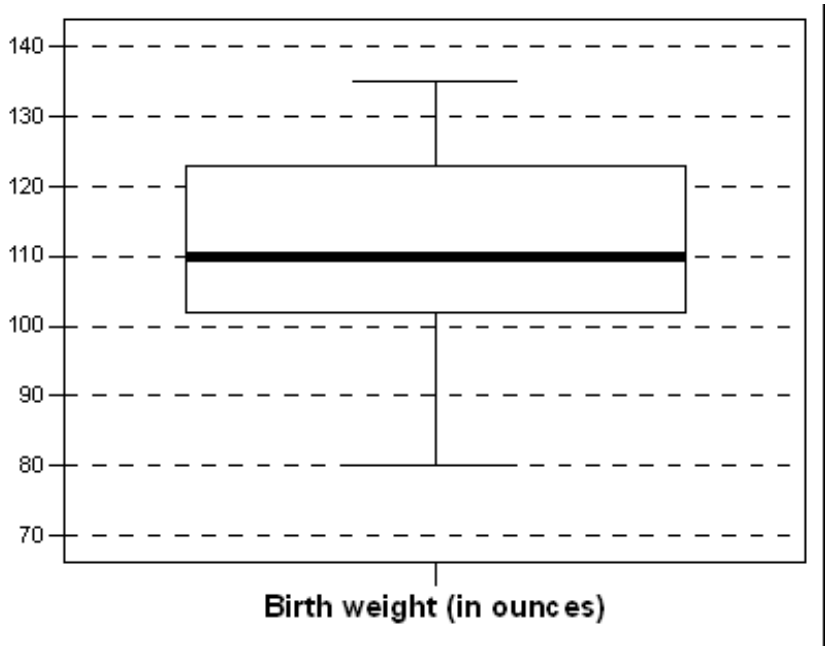
130 The following boxplot is of the birth weights (in ounces) of 160 infants born in a local hospital.



About 40 of the birth weights were below _____.

- 92 ounces
- 102 ounces
- 112 ounces
- 122 ounces

131 The following boxplot is of the birth weights (in ounces) of 160 infants born in a local hospital.



Approximately _____ children had birth weights between 102 and 122 ounces.

- 40
- 50

- (•) 80
- ( ) 100

132 This is a standard deviation contest. Which of the following sets of four numbers has the largest possible standard deviation?

- ( ) 7, 8, 9, 10
- ( ) 5, 5, 5, 5
- (•) 0, 0, 10, 10
- ( ) 0, 1, 2, 3

133 A sample of 16 people is taken, and their weights are measured. The standard deviation of these 16 measurements is computed to be 5.4.What is the variance of these measurements?

- ( ) 2.24 pounds
- ( ) 2.24 pounds2
- ( ) 29.16 pounds
- (•) 29.16 pounds2

134 There are three children aged three, four, and five in a room. If another four-year-old child enters the room, what will happen to the mean and variance?

- ( ) The mean will stay the same, but the variance will increase.
- (•) The mean will stay the same, but the variance will decrease.
- ( ) The mean and variance will both stay the same.
- ( ) The mean and variance will both decrease.

135 The standard deviation *s* is a useful measure of a characteristic of a distribution of data values. Which of the following statements about *s* is FALSE?

- ( ) The standard deviation measures the spread of the data around the mean.
- ( ) The standard deviation is appropriate as a measure of spread when the mean is chosen as the measure of center.
- (•) The standard deviation can never be zero.
- ( ) The standard deviation is not resistant; a few outliers can make s very large.
- ( ) As the data values become more spread out about their mean, s becomes larger.

136 The salaries paid to the eight employees of a small market research company are as follows: the five telephone interviewers are each paid $32,000; two administrative assistants are paid $48,000; a supervisor is paid $60,000; and the senior manager is paid $190,000. The number of

employees earning more than the mean salary is

- four.
- zero.
- one.
- (selected) two.
- seven.

137 The following data are the magnitudes of earthquakes around the world recorded on January 13, 2008.

4.1, 4.8, 3.1, 5.3, 5.1, 4.7, 3.0, 2.9, U, 4.6, 3.1, 3.0, U, 2.5.

Because of equipment problems, two earthquakes were unrecorded, although it was known that both had a value less than 2.7. The median magnitude of earthquakes on this date is

- 2.95.
- 3.9.
- 4.0.
- (selected) 3.1.
- This cannot be determined without knowing the exact value of the missing magnitudes.

138 Agricultural fairs often hold competitions for produce grown by local gardeners. The following data are the weight (in pounds) of tomatoes entered into an annual fair in Roland, Manitoba, Canada, in 2007.

2.48 1.52 1.15 1.13 1.00 0.99 0.96 0.94 0.75

The interquartile range (*IQR*) for these data is

- (selected) a value less than .40 pounds.
- a value between .50 pounds and .60 pounds.
- a value between .65 pounds and .75 pounds.
- a value greater than .80 pounds.

139 Agricultural fairs often hold competitions for produce grown by local gardeners. The following data are the weight (in pounds) of tomatoes entered into an annual fair in Roland, Manitoba, Canada, in 2007.

2.48 1.52 1.15 1.13 1.00 0.99 0.96 0.94 0.75

Apply the 1.5 × *IQR* rule to the data to check for outlier values. In this case, _____.

- there are no outliers
- the value 0.75 is the only outlier
- the values 0.75 and 2.48 are both outliers

- (●) the value 2.48 is the only outlier
- ( ) the values 1.52 and 2.48 are both outliers

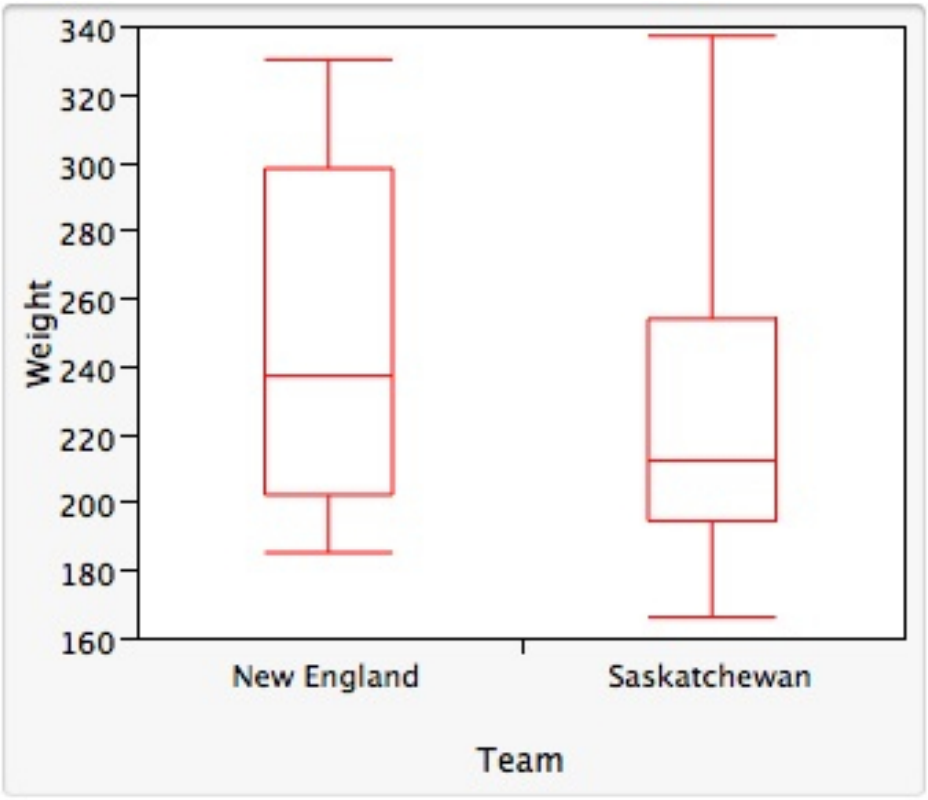
140 At a Canadian agricultural fair held in Neguac, New Brunswick, giant pumpkins were entered into a competition. The following stem-and-leaf plot of the weight (in pounds) of the 35 pumpkins in the competition was constructed, where, for example, 9|4 represents 940 pounds.

0	9
1	0378
2	449
3	22
4	12346679
5	3669
6	012269
7	16
8	0
9	04
10	8
11	9

The quartiles, Q_1 and Q_3, for these data are

- ( ) Q1 = 90 and Q3 = 1190.
- ( ) Q1 = 320 and Q3 = 640.
- ( ) Q1 = 322 and Q3 = 716.
- (●) Q1 = 320 and Q3 = 660.
- ( ) Q1 = 490 and Q3 = 660.

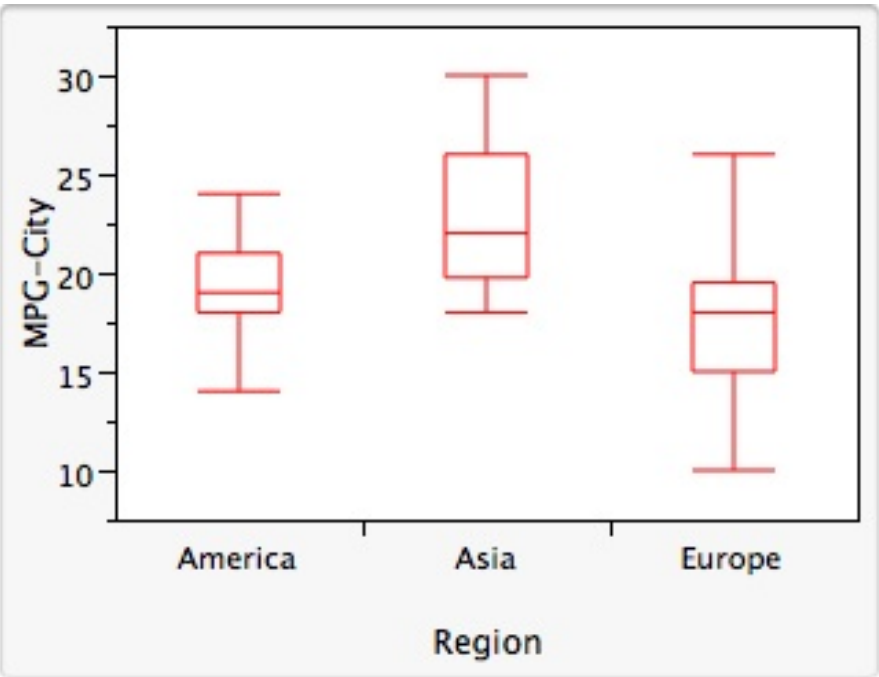
141 The New England Patriots are a top-ranked team in the National Football League and the Saskatchewan Roughriders are the 2007 champions of the Canadian Football League. From the 2007 rosters of these two teams, the weight of each player was determined and the following side-by-side boxplots of their weights is provided below.



Which of the following statements about these side-by-side boxplots is/are TRUE?

- ○ The weights of the New England team exhibit less overall variation than the Saskatchewan team.
- ◉ The median weight for the New England team is higher than the median weight for the Saskatchewan team.
- ○ The IQR for the Saskatchewan team is greater than the IQR of the New England team.

142 The fuel efficiencies of 2007 models of midsized automobiles were studied, and the side-by-side boxplots of the distribution of the miles per gallon in city driving (MPG-City) for automobiles manufactured in North America, Asia, and Europe are given below.



From these boxplots we can see that

- the MPG-City for 75% of automobiles from Asia is higher than the MPG-City for 75% of European automobiles.
- 75% of the cars from Asia have higher fuel efficiency than 50% of the cars from North America.
- the median fuel efficiency rating is highest for automobiles manufactured in Asia.
- the overall variability in fuel efficiency rating is highest for European-built automobiles.
- all of the above are correct.
- A, B, and C are correct.

143 A study was conducted on the distance that various brand name golf balls would travel. The study involved the use of a standard testing machine using a seven iron. A selection of results from the study is given below for the distance (in yards) for each brand of ball.
144.0 145.8 138.7 141.3 142.8 143.8 145.8 144.5
The mean $\bar{x}$ and the standard deviation s of these measurements (in yards) are, respectively,

- 143.90 and 3.10.
- 143.34 and 2.39.
- 142.25 and 5.73.
- 1.43.34 and 2.24.
- 143.90 and 2.39.

144 A study was conducted on the distance that various brand name golf balls would travel. The study involved the use of a standard testing machine using a seven iron. It was determined that the mean distance was $\bar{x}$ = 237.8 yards with a standard deviation of s = 4.58 yards. It was later determined that the

measuring instrument had been calibrated incorrectly and hence gave measurements that were consistently too large by 2.5 yards. Since the results of the study were to be published in Europe, it was desired to convert all measurements from yards into meters. A statistician determined that the appropriate transformation to correct the error and convert to meters in this case would be

$$y = 0.9144x - 2.286$$

where x is the measurement in yards and y in meters. The mean and standard deviation (in meters), respectively, should now be reported as _____.

- 217.4 and 1.90
- 217.4 and 4.19
- 215.2 and 4.19
- 215.2 and 1.90
- This cannot be determined without knowing the actual measurements.

145 For describing the distribution of a set of data, when is the five-number summary preferred over the mean $\bar{x}$ and standard deviation s?

- When the distribution is reasonably symmetric
- When the distribution has little skewness and there are no outliers
- If the data are provided in increasing order of magnitude
- If the data exhibit skewness and there are strong outliers
- Never, because the mean and standard deviation are always more reliable

146 A sample was taken of 20 salaries of employees in a large company. The following are the annual salaries (in thousands of dollars).For convenience, the data have been ordered.

28	31	34	35	37	41	42	42	42	47
49	51	52	52	60	61	67	72	75	77

What is the median salary of the 20 employees?

Answer:

$48,000

147 A sample was taken of 20 salaries of employees in a large company. The following are the annual salaries (in thousands of dollars). For convenience, the data have been ordered.

28	31	34	35	37	41	42	42	42	47
49	51	52	52	60	61	67	72	75	77

A histogram of the 20 salaries is slightly skewed to the right. What do we know about the mean salary of these 20 salaries,

based on this information?
Answer:

The mean is probably higher than the median.

148 A sample was taken of 20 salaries of employees in a large company. The following are the annual salaries (in thousands of dollars). For convenience, the data have been ordered.

28	31	34	35	37	41	42	42	42	47
49	51	52	52	60	61	67	72	75	77

What is the first quartile of the 20 salaries?
Answer:

$39,000

149 A sample was taken of 20 salaries of employees in a large company. The following are the annual salaries (in thousands of dollars). For convenience, the data have been ordered.

28	31	34	35	37	41	42	42	42	47
49	51	52	52	60	61	67	72	75	77

What is the interquartile range of the 20 salaries?
Answer:

$21,500

150 A sample was taken of 20 salaries of employees in a large company. The following are the annual salaries (in thousands of dollars).For convenience, the data have been ordered.

28	31	34	35	37	41	42	42	42	47
49	51	52	52	60	61	67	72	75	77

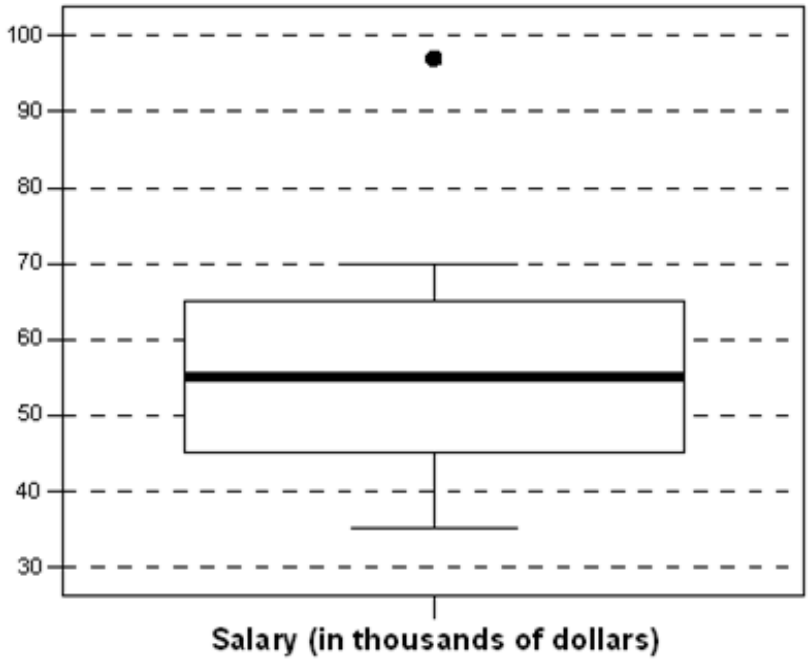
Suppose each employee in the company receives a $3000 raise for next year (each employee's salary is increased by $3000). For each of the following summary measures, indicate how it would change after the raise.

A) The median salary
B) The interquartile range of the salaries
C) The standard deviation of the salaries

Answer:

A) The median will increase by $3000.
B) The interquartile range remains unchanged.
C) The standard deviation remains unchanged.

151 A boxplot of a sample of 20 salaries from a company is shown below.



For each of the following sentences, fill in the blank.

A) The maximum salary is approximately _____.

B) The minimum salary is approximately _____.

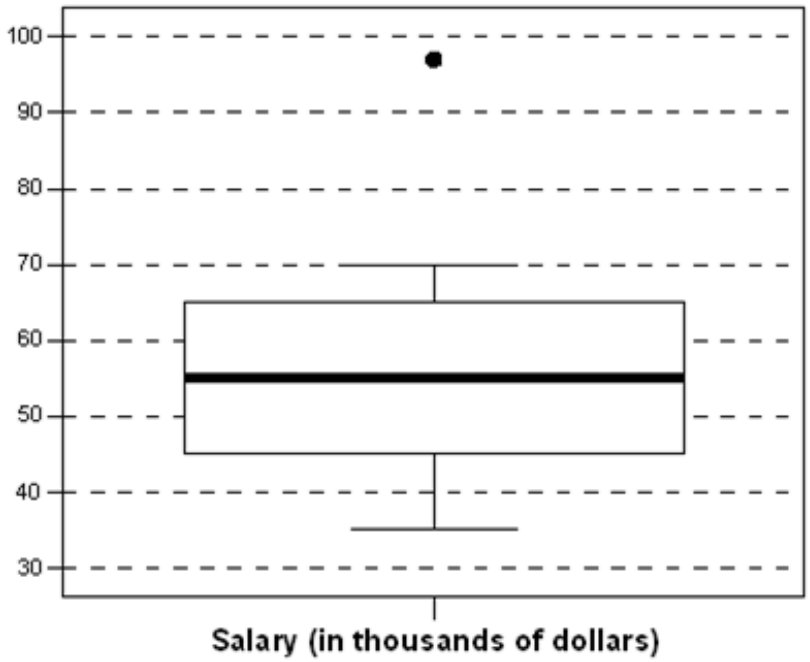
C) The interquartile range is approximately _____.

D) Seventy-five percent of the employees in this sample of 20 earn more than approximately _____.

Answer:

A) \$97,000, B) \$35,000, C) \$20,000, D) \$45,000

152 A boxplot of a sample of 20 salaries from a company is shown below.



Based on this boxplot, answer each of the following questions with yes, no, or can't tell.

A) Is the salary distribution fairly symmetric?

B) Do about 10 employees make more than $55,000?

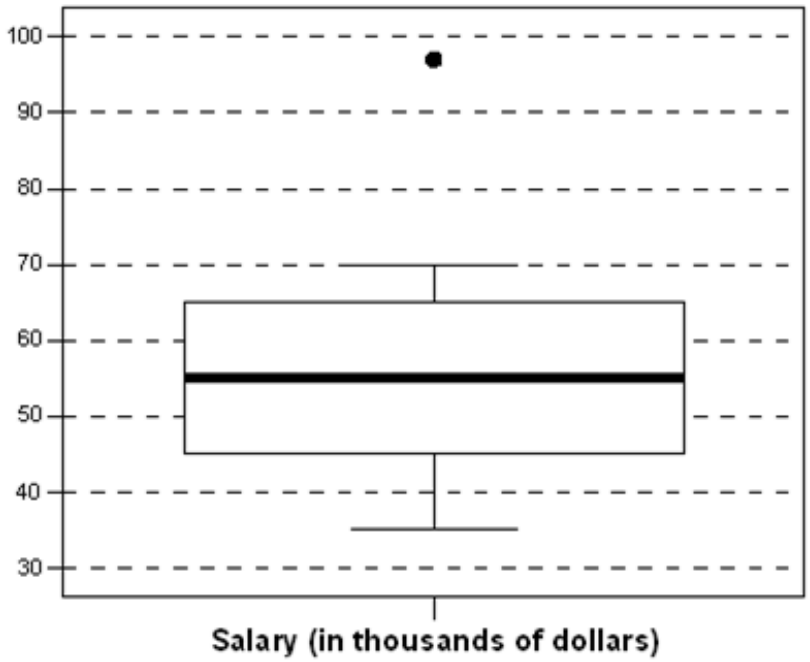
C) Does nobody make more than $71,000?

D) Is the range of the salaries roughly $35,000?

Answer:

A) Can't tell, B) Yes, C) No, D) No

153 A boxplot of a sample of 20 salaries from a company is shown below.

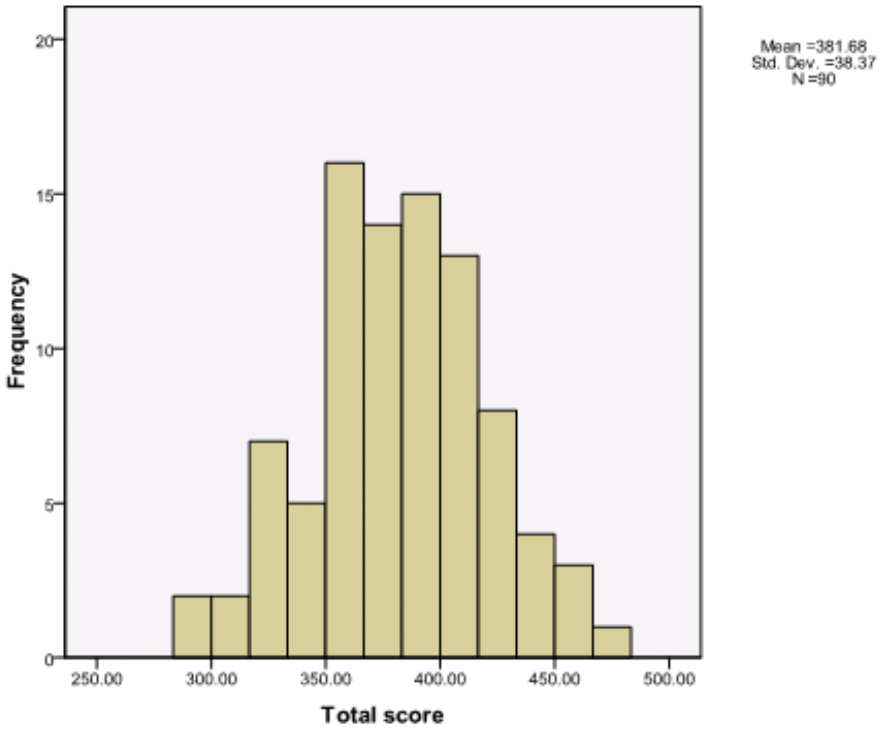


Based on this boxplot, determine the (approximate) values of the five-number summary.

Answer:

Min = \$35,000, Q_1 = \$45,000, M = \$55,000, Q_3 = \$65,000, Max = \$97,000

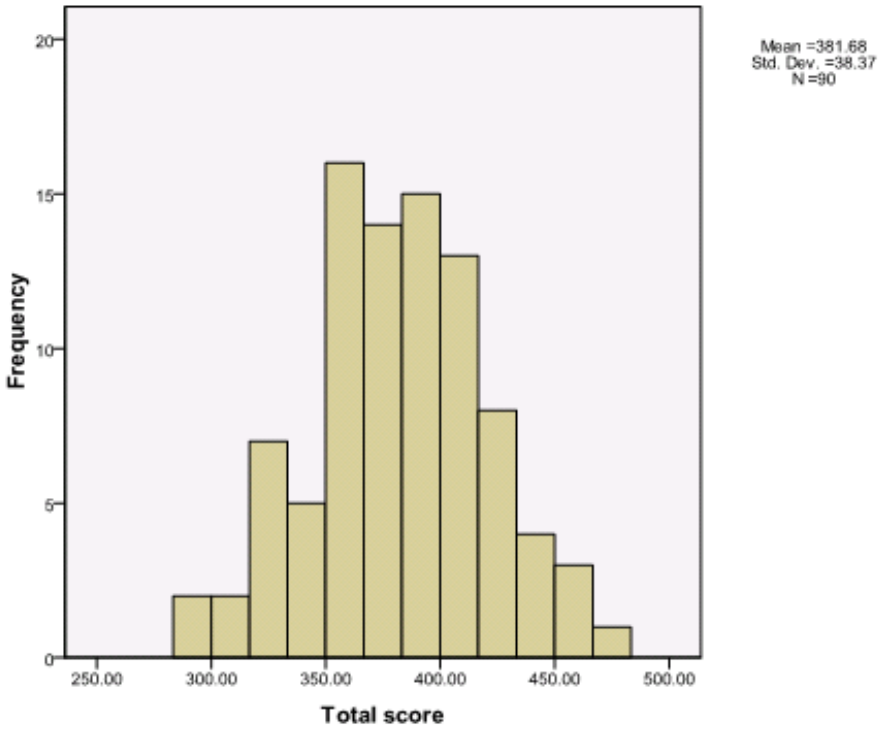
154 Psychopathic Personality Disorder (psychopathy) is defined as a condition that negatively affects one's level of empathy, conscience, and impulse control. A questionnaire was developed by Lilienfeld (1990) to asses one's level of psychopathy. Ninety random people were asked to take Lilienfeld's test. Their results are shown in the histogram below.



The scores on Lilienfeld's questionnaire range from 275 to 475.

- True
- False
- This cannot be determined from the information given.

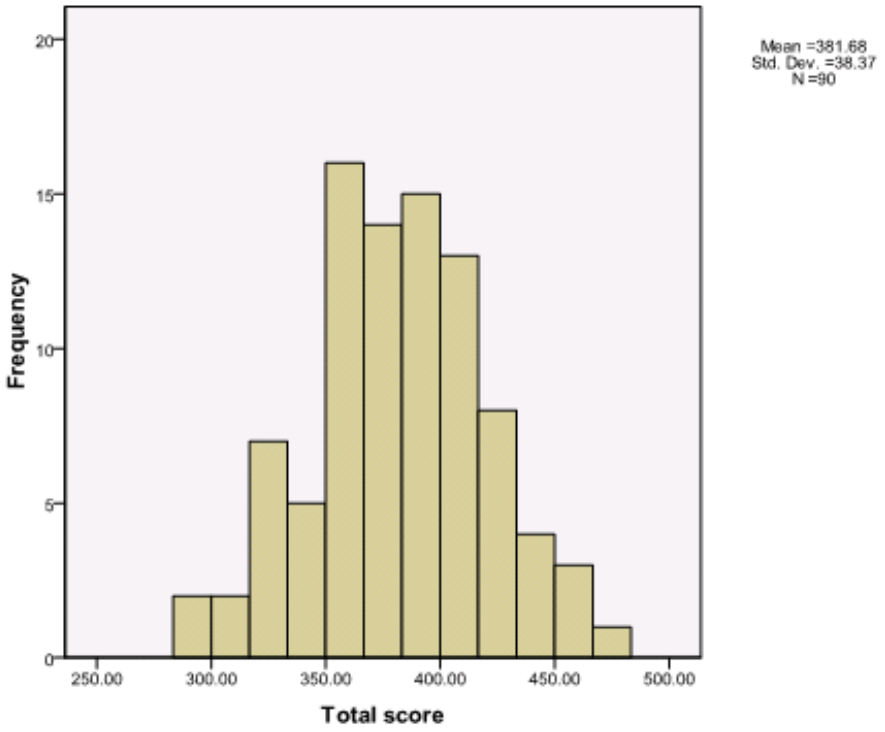
155 Psychopathic Personality Disorder (psychopathy) is defined as a condition that negatively affects one's level of empathy, conscience, and impulse control. A questionnaire was developed by Lilienfeld (1990) to asses one's level of psychopathy. Ninety random people were asked to take Lilienfeld's test. Their results are shown in the histogram below.



The data would be better represented in a pie chart.

- True
- False
- Both displays work equally well.

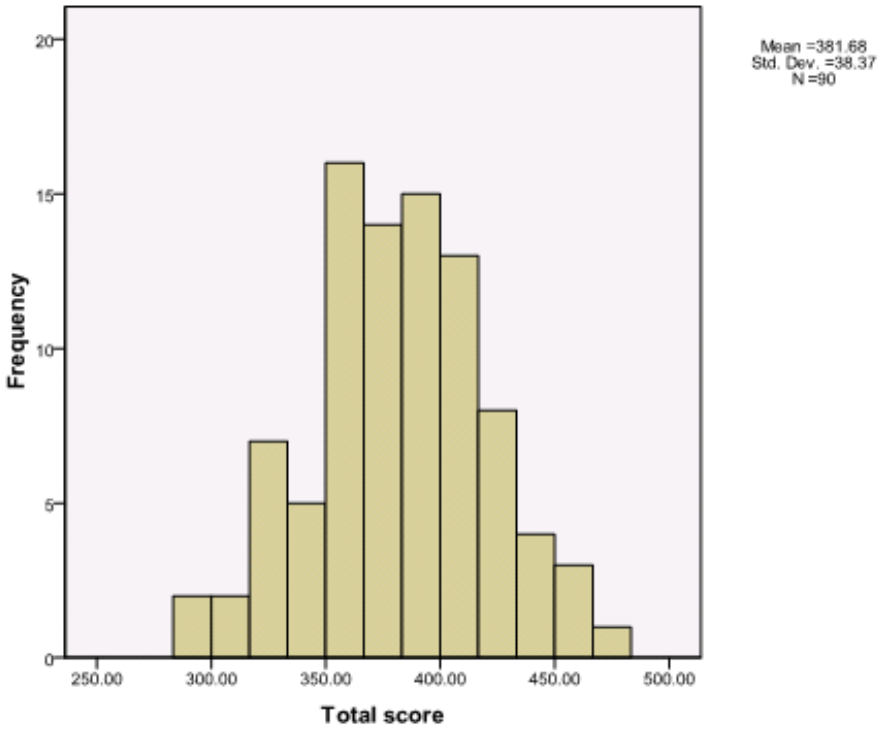
156 Psychopathic Personality Disorder (psychopathy) is defined as a condition that negatively affects one's level of empathy, conscience, and impulse control. A questionnaire was developed by Lilienfeld (1990) to asses one's level of psychopathy. Ninety random people were asked to take Lilienfeld's test. Their results are shown in the histogram below.



The data are _____.

- heavily skewed to the right
- heavily skewed to the left
- reasonably Normal

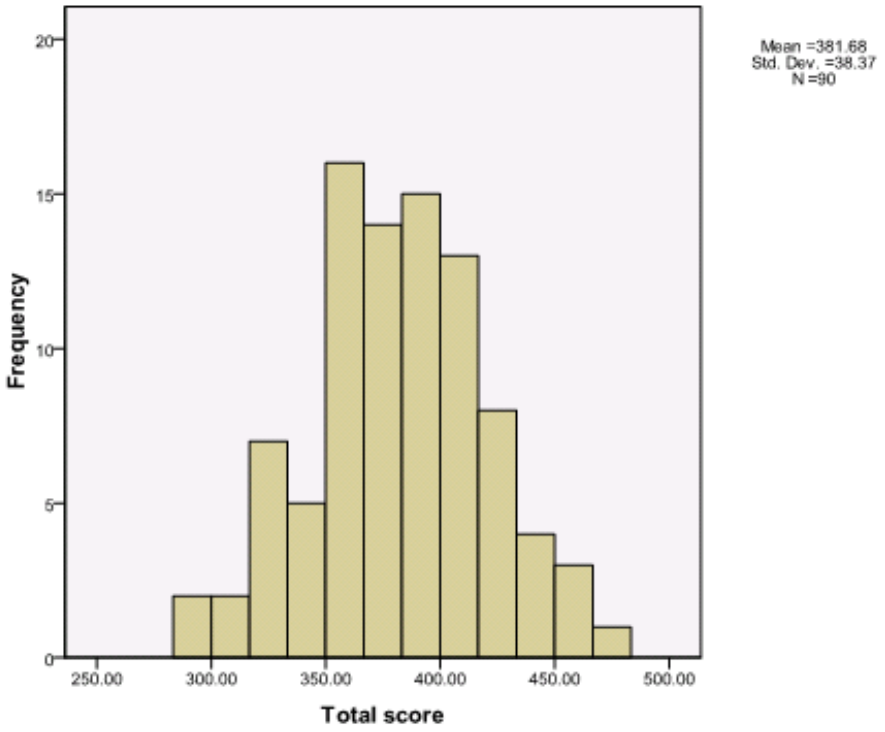
157 Psychopathic Personality Disorder (psychopathy) is defined as a condition that negatively affects one's level of empathy, conscience, and impulse control. A questionnaire was developed by Lilienfeld (1990) to asses one's level of psychopathy. Ninety random people were asked to take Lilienfeld's test. Their results are shown in the histogram below.



The mean score of these data is around _____.

- 380
- 17
- 0
- This cannot be determined from the data given.

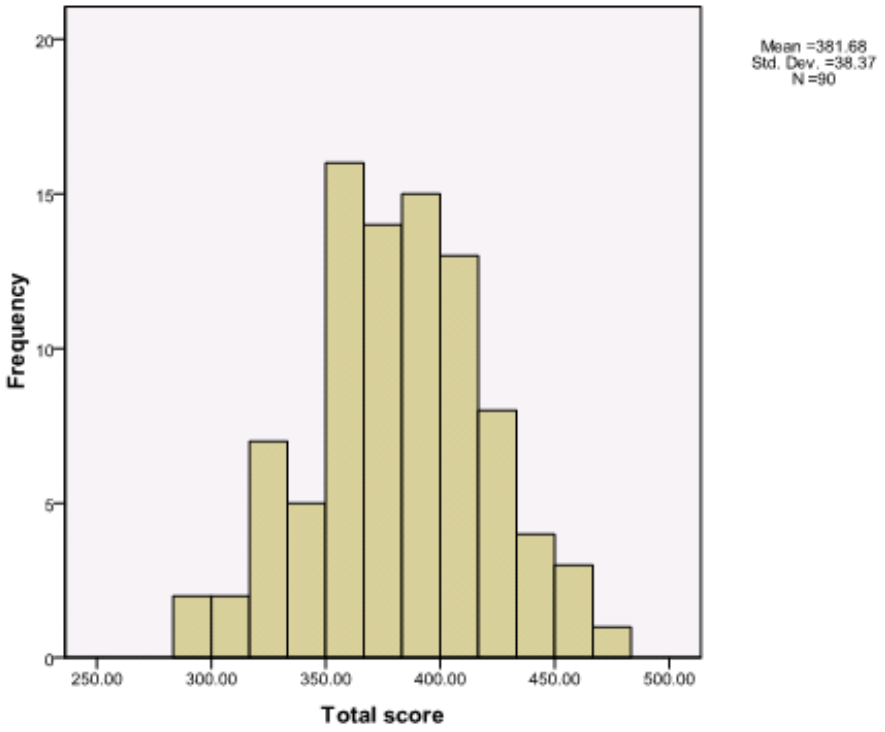
158 Psychopathic Personality Disorder (psychopathy) is defined as a condition that negatively affects one's level of empathy, conscience, and impulse control. A questionnaire was developed by Lilienfeld (1990) to asses one's level of psychopathy. Ninety random people were asked to take Lilienfeld's test. Their results are shown in the histogram below.



The minimum score is _____.

- (•) less than 300
- ( ) greater than 500
- ( ) 250
- ( ) This cannot be determined from the data given.

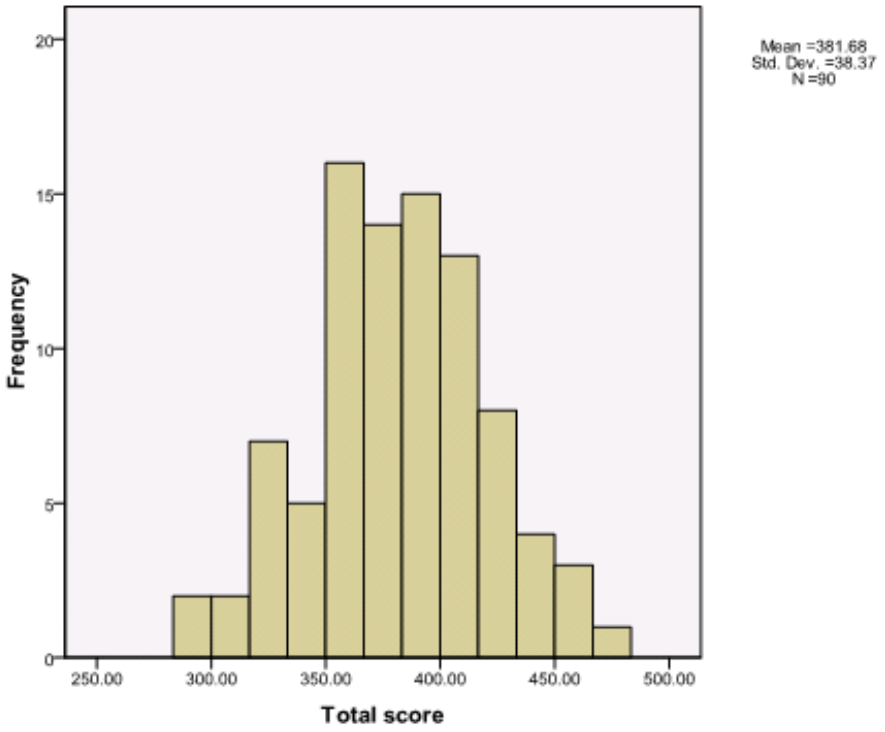
159 Psychopathic Personality Disorder (psychopathy) is defined as a condition that negatively affects one's level of empathy, conscience, and impulse control. A questionnaire was developed by Lilienfeld (1990) to asses one's level of psychopathy. Ninety random people were asked to take Lilienfeld's test. Their results are shown in the histogram below.



The maximum score is _____.

- less than 300
- greater than 500
- 250
- between 450 and 460
- None of the above

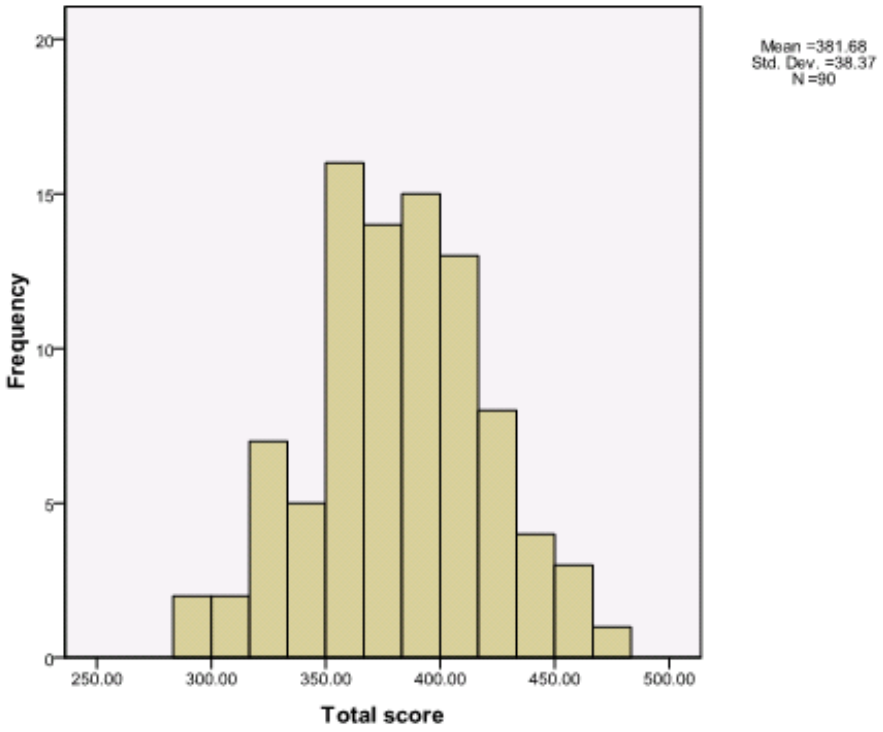
160 Psychopathic Personality Disorder (psychopathy) is defined as a condition that negatively affects one's level of empathy, conscience, and impulse control. A questionnaire was developed by Lilienfeld (1990) to asses one's level of psychopathy. Ninety random people were asked to take Lilienfeld's test. Their results are shown in the histogram below.



There are outliers in the data set.

- ○ True
- ◉ False
- ○ Can't tell

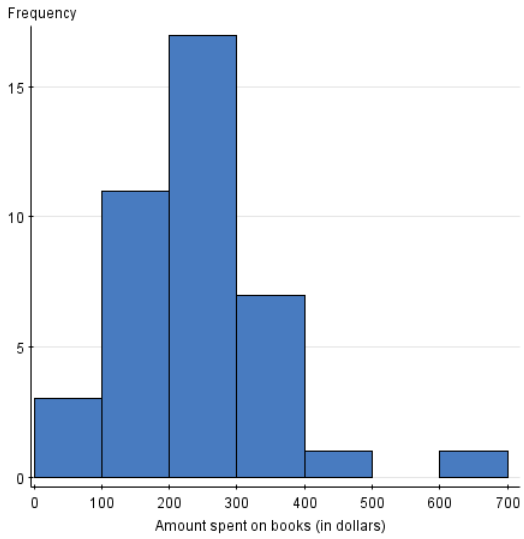
161 Psychopathic Personality Disorder (psychopathy) is defined as a condition that negatively affects one's level of empathy, conscience, and impulse control. A questionnaire was developed by Lilienfeld (1990) to asses one's level of psychopathy. Ninety random people were asked to take Lilienfeld's test. Their results are shown in the histogram below.



The histogram is unimodal.

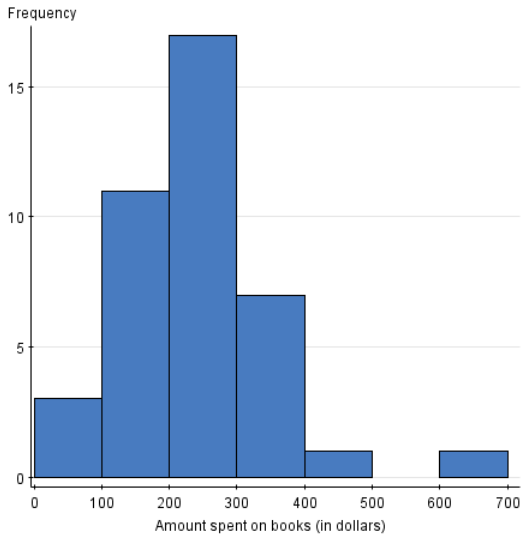
- (●) True
- ( ) False
- ( ) Can't tell

162 Consider the histogram below which is based on data from 40 students who were asked, "How much money did you spend on textbooks this semester?" What do you estimate the mean of the data as?



- ( ) Between $600 and $700
- ( ) Between $100 and $150
- ( ) $700
- (●) Between $200 and $300

163 Consider the histogram below which is based on data from 40 students who were asked, “How much money did you spend on textbooks this semester?” What do you estimate the median of the data as?



- $100
- Between $600 and $700
- Between $200 and $300
- None of the above

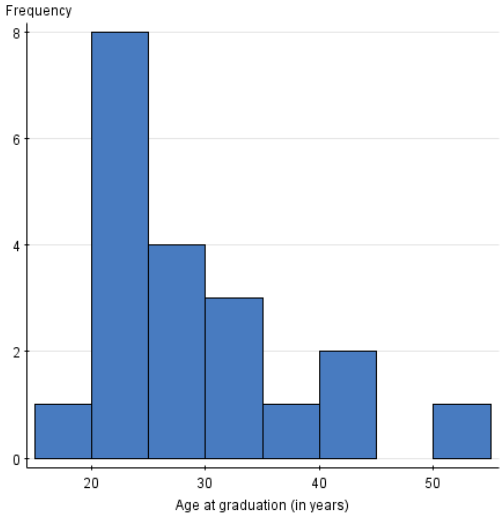
164 Minecraft is a popular video game about placing blocks to build anything you can imagine. We surveyed 20 students at each of three elementary schools to find out how much time (in minutes) they spend per week playing the game. Which histogram appears to show the highest mean?

-
-
-
- All three have about the same mean.

165 Minecraft is a popular video game about placing blocks to build anything you can imagine. We surveyed 20 students at each of three different elementary schools to find out how much time (in minutes) they spend per week playing the game. Which histogram appears to show the highest median?

-
-
-
- They all have about the same median.

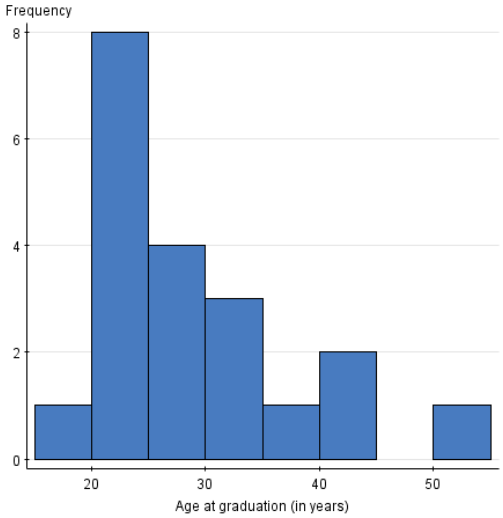
166 Twenty professional athletes were asked, “What age did you graduate from college?” The responses are displayed in the histogram below.



What is the best measure of the central tendency for these data?

- Mean
- Median
- Standard deviation
- Degrees of freedom

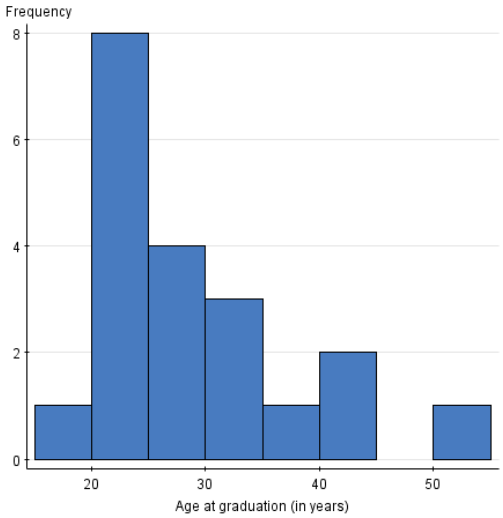
167 Twenty professional athletes were asked, "What age did you graduate from college?" The responses are displayed in the histogram below.



Which of the statistics below appear to be the largest based on these data?

- Min
- Mean
- Median
- Range

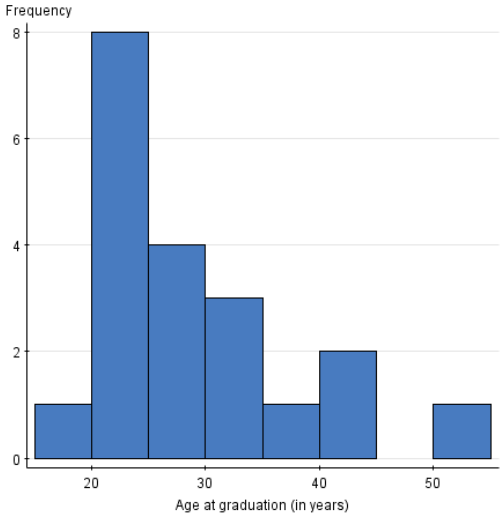
168 Twenty professional athletes were asked, "What age did you graduate from college?" The responses are displayed in the histogram below.



Which of the statistics below appear to be the smallest based on these data?

- Max
- Mean
- Median
- Range

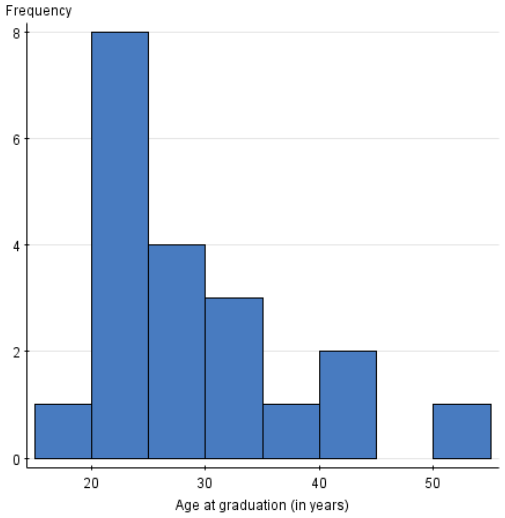
169 Twenty professional athletes were asked, “What age did you graduate from college?” The responses are displayed in the histogram below.



Do there appear to be any outliers in the data set?

- Yes
- No
- Can't tell

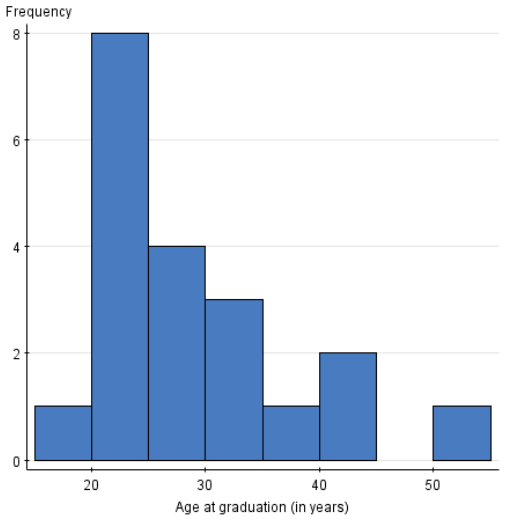
170 Twenty professional athletes were asked, “What age did you graduate from college?” The responses are displayed in the histogram below.



Does the distribution appear to be symmetric?

- Yes
- No
- Can't tell

171 Twenty professional athletes were asked, “What age did you graduate from college?” The responses are displayed in the histogram below.



The maximum value is

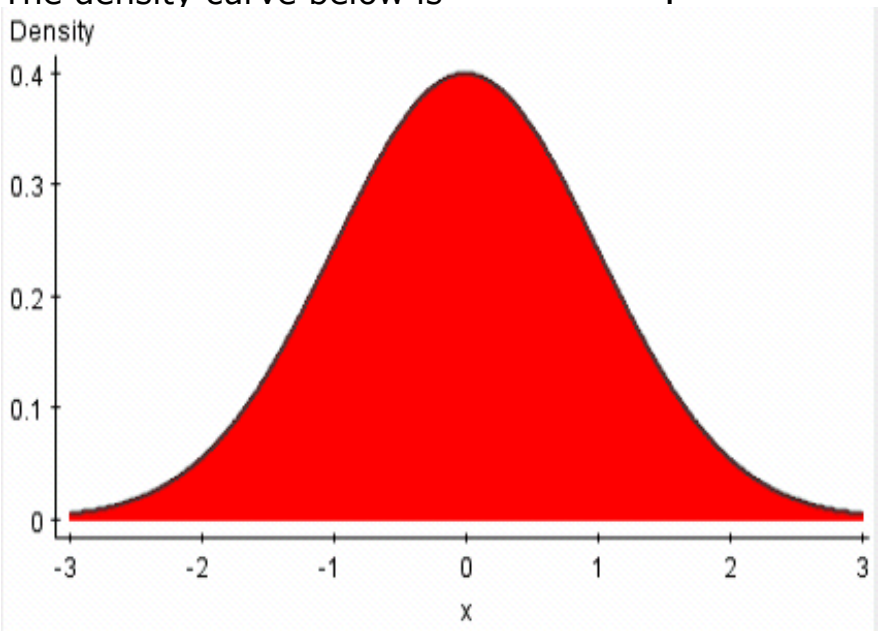
- 50.
- 55.
- 60.
- Can't tell.

172 Which density curve below has the largest standard deviation?

-
-
-

173 Which density curve below has the smallest standard deviation?

174 The density curve below is .



- right-skewed
- left-skewed
- symmetric
- None of the above

175 Which of the following does not adequately reveal outliers?

- Density curves
- Stemplots
- Histograms
- Modified boxplots

176 The number of Facebook friends students at a university have are Normally distributed with a mean of 1200 and a standard deviation of 200. What percentage of students has at least 1000 Facebook friends?

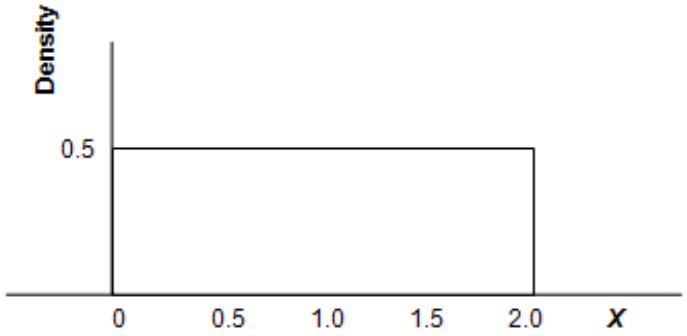
- 84.13%
- 15.86%
- 42.07%
- None of the above

177 The number of Facebook friends students at a university

have are Normally distributed with a mean of 1200 and a standard deviation of 200. What percentage of students has exactly 1000 Facebook friends?

- 84.13%
- 15.86%
- 42.07%
- None of the above

178 Determine whether each of the following statements regarding the density curve below is true or false.

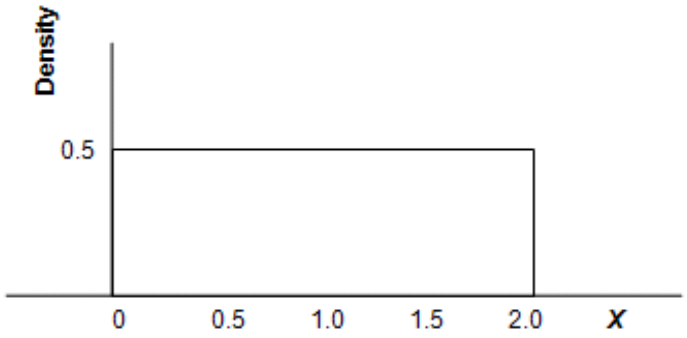


A) It is symmetric.
B) The total area under the curve is 1.
C) The median is 1.
D) The mean is 1.

Answer:

A) True, B) True, C) True, D) True

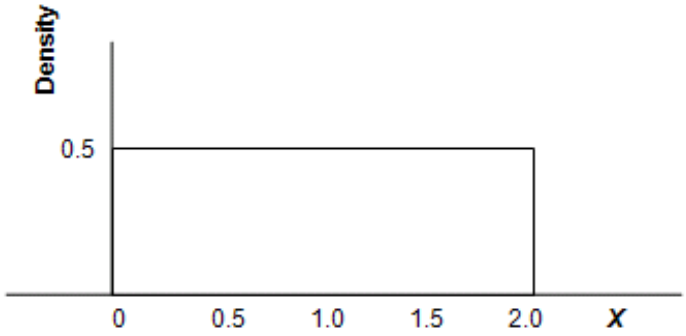
179 For the density curve below, what percentage of the observations lies above 1.5?



- 25%
- 50%
- 75%
- 80%

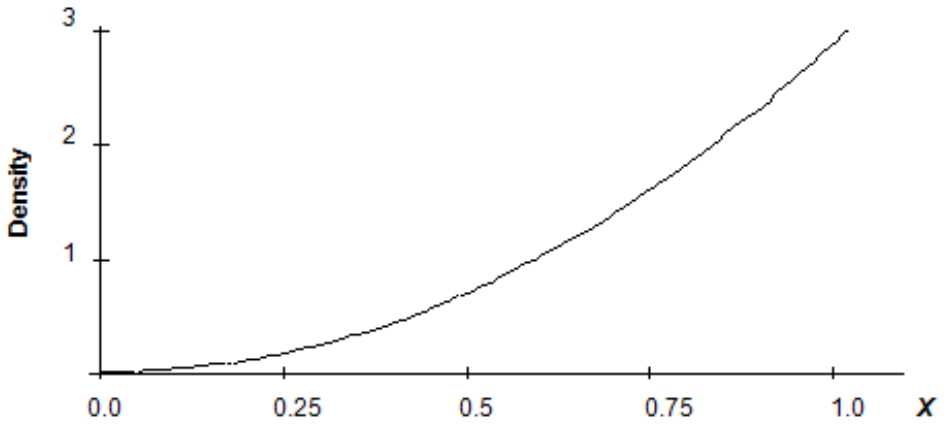
180 For the density curve below, what percentage of the

observations lies between 0.5 and 1.2?



- 25%
- 35%
- 50%
- 70%

181 For the density curve below, which one of the following is TRUE?



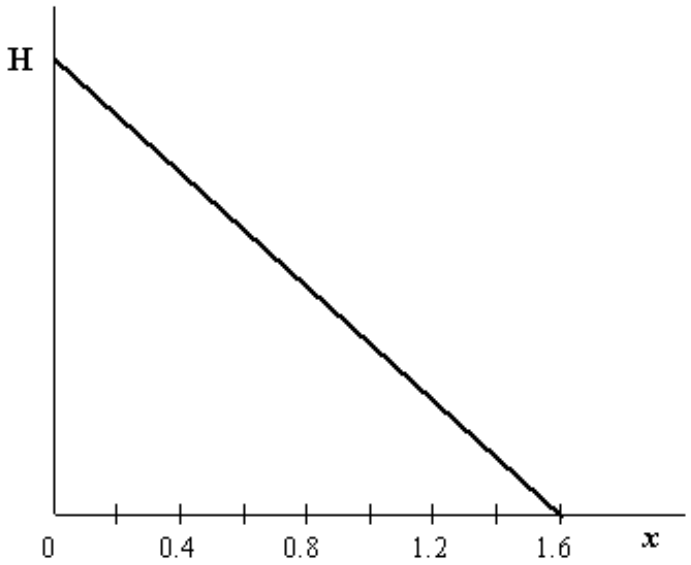
- The mean and median are equal.
- The mean is greater than the median.
- The mean is less than the median.
- The mean could be either greater than or less than the median.

182 Which one of the following statements about a density curve is FALSE?

- A density curve always has an area beneath it equal to 1.
- A density curve can adequately describe outliers observed in data.
- A density curve is always on or above the horizontal axis.
- A density curve comes in many shapes, some of which are symmetric while others are skewed.
- The area under a density curve above any range of values is the proportion of all observations that fall in that

range.

183 The following curve is to be a density curve for the variable ***x***.



What must be the value of the point on the vertical axis labeled **H** for this to be a proper density function?

- 1.60
- 1.00
- 1.25
- 0.625

184 Which one of the following statements about the mean and the median of a density curve is FALSE?

- The median is the point on the axis that divides the area under the density curve in two equal halves.
- The median and the mean have the same value if the density curve is symmetric.
- The mean is the "balance point" of the density curve.
- The median of a skewed density curve is pulled away from the mean in the direction of the long tail.
- For a symmetric density curve, both the mean and the median are at the center of the curve.

185 For the density curve displayed below, what is the mean?

- 0.25
- (•) 0.50
- 0.71
- 0.75

186 Determine whether each of the following statements regarding a Normal density curve is true or false.
A) It is symmetric.
B) It has a peak centered above its mean.
C) The quartiles lie 1 standard deviation below and above the mean.
D) The spread of the curve is proportional to the standard deviation.

Answer:

A) True, B) True, C) False, D) True

187 Many residents of suburban neighborhoods own more than one car but consider one of their cars to be the main family vehicle. The age of these family vehicles can be modeled by a Normal distribution with a mean of 2 years and a standard deviation of 6 months. What percentage of family vehicles is between 1 and 3 years old?

- This cannot be determined based on the information given.
- 68%
- (•) 95%
- 99.7%

188 Many residents of suburban neighborhoods own more than one car but consider one of their cars to be the main family vehicle. The age of these family vehicles can be modeled by a Normal distribution with a mean of 2 years and a standard deviation of 6 months. What is the standardized value for a family vehicle that is 3 years and

3 months old?

- 0.22
- 2.5
- 2.6
- 2.92

189 Items produced by a manufacturing process are supposed to weigh 90 grams. However, there is variability in the items produced, and they do not all weigh exactly 90 grams. The distribution of weights can be approximated by a Normal distribution with a mean of 90 grams and a standard deviation of 1 gram. What percentage of the items will either weigh less than 87 grams or more than 93 grams?

- 6%
- 94%
- 99.7%
- 0.3%

190 The time to complete an 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?

- 68%
- 32%
- 16%
- 5%

191 Using the standard Normal distribution tables, what is the area under the standard Normal curve corresponding to $Z < 1.1$?

- 0.1357
- 0.2704
- 0.8413
- 0.8643

192 Using the standard Normal distribution tables, what is the area under the standard Normal curve corresponding to $Z > -1.22$?

- 0.1151
- 0.1112
- 0.8849
- 0.8888

193 Using the standard Normal distribution tables, what is the area under the standard Normal curve corresponding to $-0.5 < Z < 1.2$?

- 0.3085

- 0.8849
- (•) 0.5764
- 0.2815

194 The variable Z has a standard Normal distribution. Find the value z such that 85% of the observations fall below z.

- z = −1.04
- z = 0.80
- z = 0.85
- (•) z = 1.04

195 The variable Z has a standard Normal distribution. Find the value z such that the event $Z > z$ has proportion of 0.08.

- z = −1.41
- z = 0.53
- z = 0.82
- (•) z = 1.41

196 The temperature at any random location in a kiln used for manufacturing bricks is Normally distributed with a mean of 1000°F and a standard deviation of 50°F. If bricks are fired at a temperature above 1125°F, they will crack and must be discarded. If the bricks are placed randomly throughout the kiln, what is the percentage of bricks that crack during the firing process?

- (•) 0.62%
- 2.28%
- 47.72%
- 49.38%

197 The temperature at any random location in a kiln used for manufacturing bricks is Normally distributed with a mean of 1000°F and a standard deviation of 50°F. When glazed bricks are put in the oven, if the temperature is below 900°F, they will discolor. If the bricks are placed randomly throughout the kiln, what percentage of glazed bricks will discolor?

- 0.62%
- (•) 2.28%
- 47.72%
- 49.38%

198 The scores on a university examination are Normally distributed with a mean of 62 and a standard deviation of 11. If the bottom 5% of students will fail the course, what is the lowest mark that a student can have and still be awarded a passing grade?

- 62

- 57
- 44
- 40

199 The preparation time to mail envelopes with a weekly report to all executives in a company has a Normal distribution with a mean of 35 minutes and a standard deviation of 2 minutes. On 95% of such occasions, the mailing preparation takes less than *x* minutes. What is the value of *x*?

- 31.71
- 34.75
- 35.25
- 38.29

200 A softdrink machine can be regulated so that it discharges an average of *?* ounces per cup. If the ounces of fill are Normally distributed with a standard deviation of 0.4 ounces, what value should *?* be set at so that 6-ounce cups will overflow only 2% of the time?

- 5.18
- 5.60
- 6.00
- 6.82

201 The weights of packets of cookies produced by a certain manufacturer have a Normal distribution with a mean of 202 grams and a standard deviation of 3 grams. What is the weight that should be stamped on the packet so that only 1% of the packets are underweight?

- 195 grams
- 202 grams
- 209 grams
- There is not enough information to tell.

202 A company produces packets of soap powder labeled "Giant size 32 ounces." The actual weight of soap powder in such a box has a Normal distribution with a mean of 33 ounces and a standard deviation of 0.7 ounces. To avoid dissatisfied customers, a box of soap is considered underweight if it weighs less than 32 ounces. To avoid losing money, the top 5% (the heaviest 5%) is labeled overweight. What proportion of boxes is underweight?

- 0.0766
- 0.2420
- 0.7580
- 0.9234

203 A company produces packets of soap powder labeled

"Giant size 32 ounces." The actual weight of soap powder in such a box has a Normal distribution with a mean of 33 ounces and a standard deviation of 0.7 ounces. To avoid dissatisfied customers, a box of soap is considered underweight if it weighs less than 32 ounces. To avoid losing money, the top 5% (the heaviest 5%) is labeled overweight. How heavy does a box have to be in order for the box to be labeled overweight?

- 31.60 ounces
- 31.85 ounces
- 34.15 ounces
- 34.40 ounces

204 Chocolate bars produced by a certain machine are labeled with 8.0 ounces. The distribution of the actual weights of these chocolate bars is Normal with a mean of 8.1 ounces and a standard deviation of 0.1 ounces. A chocolate bar is considered underweight if it weighs less than 8.0 ounces. What proportion of chocolate bars weighs less than 8.0 ounces?

- 0.159
- 0.341
- 0.500
- 0.841

205 Chocolate bars produced by a certain machine are labeled with 8.0 ounces. The distribution of the actual weights of these chocolate bars is Normal with a mean of 8.1 ounces and a standard deviation of 0.1 ounces. A chocolate bar is considered underweight if it weighs less than 8.0 ounces. What proportion of chocolate bars weighs between 8.2 and 8.3 ounces?

- 0.136
- 0.477
- 0.636
- 0.819

206 Chocolate bars produced by a certain machine are labeled with 8.0 ounces. The distribution of the actual weights of these chocolate bars is Normal with a mean of 8.1 ounces and a standard deviation of 0.1 ounces. A chocolate bar is considered underweight if it weighs less than 8.0 ounces. How should the chocolate bar wrappers be labeled so that only 1% of such bars are underweight?

- 7.77 ounces
- 7.87 ounces
- 8.23 ounces
- 8.33 ounces

207 A market research company employs a large number of typists to enter data into a computer database. The time it takes for potential new typists to learn the computer system is known to have a Normal distribution with a mean of 90 minutes and a standard deviation of 18 minutes. A candidate is automatically hired if she learns the computer system in less than 100 minutes. A cut-off time is set at the slowest 10% of the learning distribution. Anyone slower than this cut-off time is definitely not hired. What proportion of candidates takes more than 2 hours to learn the computer system?

- (•) 0.048
- ( ) 0.452
- ( ) 0.711
- ( ) 0.952

208 A market research company employs a large number of typists to enter data into a computer database. The time it takes for potential new typists to learn the computer system is known to have a Normal distribution with a mean of 90 minutes and a standard deviation of 18 minutes. A candidate is automatically hired if she learns the computer system in less than 100 minutes. A cut-off time is set at the slowest 10% of the learning distribution. Anyone slower than this cut-off time is definitely not hired. What proportion of candidates will be hired automatically?

- ( ) 0.048
- ( ) 0.452
- (•) 0.711
- ( ) 0.952

209 A market research company employs a large number of typists to enter data into a computer database. The time it takes for potential new typists to learn the computer system is known to have a Normal distribution with a mean of 90 minutes and a standard deviation of 18 minutes. A candidate is automatically hired if she learns the computer system in less than 100 minutes. A cut-off time is set at the slowest 10% of the learning distribution. Anyone slower than this cut-off time is definitely not hired. What is the cut-off time the market research company uses?

- ( ) 1 hour and 7 minutes
- (•) 1 hour and 53 minutes
- ( ) 2 hours
- ( ) 2 hours and 8 minutes

210 Which of the following statements about the standardized z-score of a value of a variable X, which has a mean of m

and a standard deviation of *s*, is/are TRUE?

- The z-score has a mean equal to 0.
- The z-score has a standard deviation equal to 1.
- The z-score tells us how many standard deviation units from the original observation fall away from the mean.
- The z-score tells us the direction the observation falls away from the mean.
- All of the above statements about the z-score are true.

211 A well-known maker of jams and jellies packages its jams in jars labeled "250 milliliters." The process used to fill the jars is known to dispense an amount of jam that is a Normally distributed variable with *?* = 252 milliliters and *?* = 0.9 milliliters. What proportion of the jars filled by the process will contain less than 250 milliliters?

- 0.5
- 0.9868
- 0.0068
- 0.0131
- 0

212 A well-known maker of jams and jellies packages its jams in jars labeled "250 milliliters." The process used to fill the jars is known to dispense an amount of jam that is a Normally distributed variable with *?* = 252 milliliters and *?* = 0.9 milliliters. What proportion of jars from this filling process will contain no more than 253.5 milliliters?

- 0.9678
- 0.9522
- 0.9973
- 0.0027
- 0.0475

213 A well-known maker of jams and jellies packages its jams in jars labeled "250 milliliters." The process used to fill the jars is known to dispense an amount of jam that is a Normally distributed variable with *?* = 252 milliliters and *?* = 0.9 milliliters. What percentage of jars will be filled with between 251 milliliters and 254 milliliters?

- 85.3%
- 1.3%
- 14.7%
- 13.4%
- 8.5%

214 A well-known maker of jams and jellies packages its jams in jars labeled "250 milliliters." The process used to fill the jars is known to dispense an amount of jam that is a

Normally distributed variable with *?* = 252 milliliters and *?* = 0.9 milliliters. What proportion of jars will be filled with what the label claims is 250 milliliters?

- 0.9868
- 0
- 0.0068
- 0.0132
- 0.0027

215 A well-known maker of jams and jellies packages its jams in jars labeled "250 milliliters." The process used to fill the jars is known to dispense an amount of jam that is a Normally distributed variable with *?* = 252 milliliters and *?* = 0.9 milliliters. If changing *?* while keeping *?* the same were possible for this process, what should *?* be set at so that the percentage of jars filled with less than 250 milliliters will be at most 0.2%?

- ? = 2.38
- ? = 1
- ? = 0.69
- ? = 0.82
- It should not be within ± 0.2 of any of the above.

216 A tool and die company has been contracted to produce metal castings into which a hole is to be drilled to a diameter of 2.5 centimeters. Because of the variability in the drilling process, the actual diameter of the hole is a Normally distributed variable with a mean of 2.5 centimeters and a standard deviation of 0.1 centimeters. The proportion of castings produced by this process with a hole whose diameter is within 0.2 centimeters of the desired value is

- 0.9772.
- 0.9549.
- 0.9974.
- 0.6826.
- 0.0228.

217 In 1998 the World Health Organization reported the findings of a major study on the quality of blood pressure monitoring around the world. In its report it stated that for Canada the results for diastolic blood pressure had a mean of 78 mmHg and a standard deviation of 11 mmHg. Assuming that diastolic blood pressure measurements are Normally distributed, the DBP reading that represents the 80th percentile of the distribution is

- 85.4.
- 93.6.
- 87.3

- 86.8.
- 68.8.

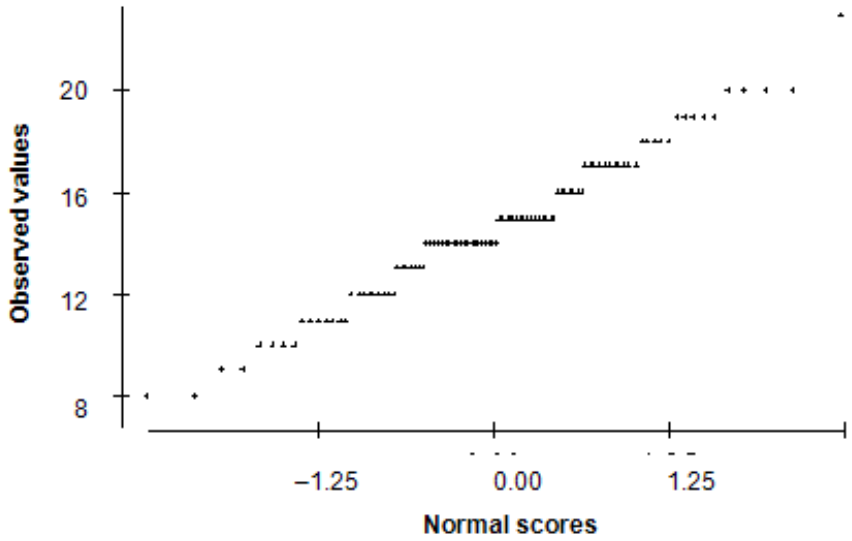
218 In the blood pressure study by the WHO, the mean systolic blood pressure in the United States was reported to be 120 mmHg. The 75th percentile of the distribution of SBP measurements was found to be 109.2 mmHg. From this, it can be determined that the SBP standard deviation *?* is

- 9.4.
- 16.0.
- 5.5.
- 10.8.
- It is not within ± 0.5 of any of the above.

219 A stemplot of a set of data is roughly symmetric, but a quantile plot does not show a straight line. What conclusion can we draw?

- The data are Normal but not standard Normal.
- The data are standard Normal.
- The data are not Normal.
- The data are Normal.

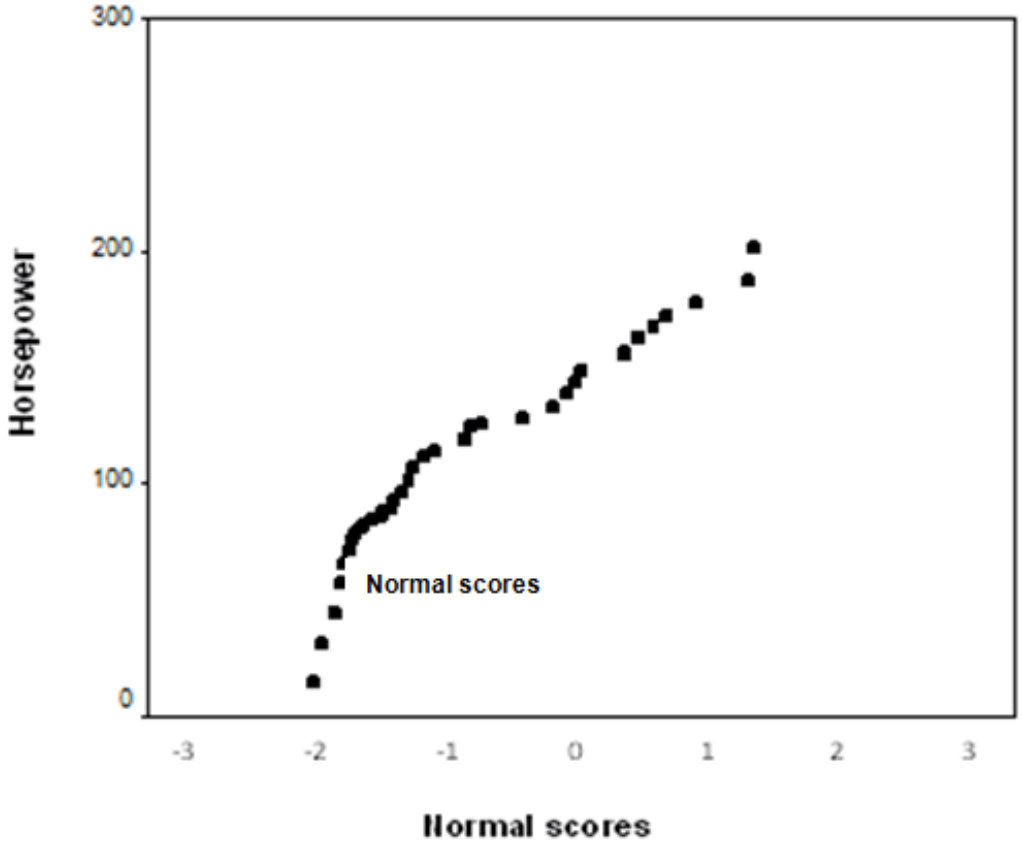
220 Consider the following Normal quantile plot.



What is the most striking feature of the plot?

- The granularity
- The strong skewness indicated by the plot
- The many outliers evident in the plot
- The fact that Y is categorical

221 A quantile plot of the horsepower of a sample of 65 cars is shown below.



Which of the following descriptions best describes the shape of the distribution of horsepower?

- Normal
- Normal with some outliers
- Left-skewed
- Right-skewed

222 Which of the following statements about Normal quantile plots is/are FALSE?

- In constructing a Normal quantile plot, each data point is plotted against its corresponding Normal score.
- The Normal quantile plot is a very useful graphical tool for assessing the adequacy of the Normal model.
- If the points on a Normal quantile plot lie close to a straight line, the plot indicates that the Normal model is an adequate representation for the data.
- Because you will see the usual mound-like appearance of the Normal distribution on a histogram, it is more helpful than the quantile plot for assessing Normality.
- On a quantile plot, outliers will appear as points that are far away from the overall pattern of the plot.

223 Battery packs in electric go-carts need to last a fairly long time. The runtimes (time until it needs to be recharged) of the battery packs made by a particular company are Normally distributed with a mean of 2 hours and a

standard deviation of 20 minutes. What percentage of these battery packs lasts longer than 3 hours?

Answer:

0.13%

224 Battery packs in electric go-carts need to last a fairly long time. The runtimes (time until it needs to be recharged) of the battery packs made by a particular company are Normally distributed with a mean of 2 hours and a standard deviation of 20 minutes. What is the third quartile for the run-time distribution?

Answer:

2 hours and 13.5 minutes

225 Battery packs in electric go-carts need to last a fairly long time. The runtimes (time until it needs to be recharged) of the battery packs made by a particular company are Normally distributed with a mean of 2 hours and a standard deviation of 20 minutes. Battery packs that have a runtime in the highest 10% of the run-time distribution are highly sought after by go-cart drivers. How long does the battery pack have to last for it to fall in this highly sought-after class?

Answer:

2 hours and 25.6 minutes

226 A machine fills 64-ouncejugs with detergent. Assume the distribution of the amount of detergent in these jugs is Normal. Under standard circumstances, the mean amount should be 64 ounces with a standard deviation of 0.4 ounces. A quality control inspector regularly checks the amount poured into the jugs to see if the machine needs an adjustment or not, which is needed when the machine either overfills or underfills the jugs. If the machine is running on target, what proportion of jugs receives more than 65 ounces of detergent?

Answer:

0.0062

227 A machine fills 64-ouncejugs with detergent. Assume the distribution of the amount of detergent in these jugs is Normal. Under standard circumstances, the mean amount should be 64 ounces with a standard deviation of 0.4 ounces. A quality control inspector regularly checks the amount poured into the jugs to see if the machine needs

an adjustment or not, which is needed when the machine either overfills or underfills the jugs. The quality control inspector will adjust the machine if he finds too many jugs that fall in the most extreme 5% of the distribution. Most extreme is defined as either too little (bottom 2.5%) or too much (top 2.5%). If the machine is running on target, what are the bounds for which the machine will be classified as working fine?

Answer:

63.2 ounces and 64.8 ounces