Chapter 2

Student: _____

1. A stem-and-leaf display is a graphical portrayal of a data set that shows the data set's overall pattern of variation.

   True False

2. The median is the measure of central tendency that divides a population or sample into four equal parts.

   True False

3. The population mean is the average of the population measurements.

   True False

4. The mode is the measurement in a sample or population that occurs most frequently.

   True False

5. The population mean is a point estimate of the sample mean.

   True False

6. The median is said to be resistant to extreme values.

   True False

7. The range of set of measurements is the largest measurement plus the small measurement.

   True False

8. The population variance is the average of the squared deviations of the individual population measurements from the population mean.

   True False

9. In a symmetric population, the median equals the mean.

   True False

10. It is appropriate to use the Empirical Rule to describe a population that is extremely skewed.

    True False

11. The median is the value below which approximately 50 percent of the measurements lie.

    True False

12. An independent variable is a variable that can be used to describe, predict, or control a dependent variable.

    True False

13. The relative frequency is the frequency of a class divided by the total number of measurements.

    True False

14. The box-and-whiskers display is a graphical portrayal of data sets that depict both the central tendency and variability of the data.

    True False

15. When establishing the classes for a frequency table it is generally agreed that the more classes you use the better your frequency table will be.

    True False

16. If there are 7 classes in a frequency distribution, then the fourth class will always contain the median.

    True False

17. A Pareto chart is a type of histogram.

    True False

18. Range is a better measure of variation than standard deviation.

    True False

19. A normal population has 99.73 percent of the population measurements within _____ standard deviations of the mean.

A. one

B. two

C. three

D. four

E. five

20. A number calculated using the sample measurements that describes some aspect of the sample is a sample _____.

A. mean

B. variance

C. statistic

D. parameter

E. scale

21. All of the following can be used to describe quantitative data with the exception of a _____.

A. histogram

B. stem-and-leaf display

C. dot plot

D. pie chart

E. scatter plot

22. All of the following are measures of central tendency except the _____.

A. range

B. mode

C. mean

D. median

23. A measurement that is separated from most of the other measurements is a(n) _____.

A. absolute extreme

B. outlier

C. mode

D. quartile

E. median

24. Which of the following graphs is used to summarize qualitative data?

A. Histogram

B. Bar Chart

C. Time series plot

D. Stem-and-leaf display

E. Scatter plot

25. Which percentile describes the first quartile, Q1?

A. 25^{th}

B. 50^{th}

C. 75^{th}

D. 100^{th}

E. 125^{th}

26. Which percentile describes the third quartile, Q3?

A. 25^{th}

B. 50^{th}

C. 75^{th}

D. 100^{th}

E. 125^{th}

27. A plot of the values of a dependent variable y versus the values of an independent variable x is a _____ plot.

A. runs

B. scatter

C. dot

D. time series

E. box

28. A stem-and-leaf display is best used to _____

A. provide a point estimate of the variability in the population.

B. provide a point estimate of the central tendency in the population.

C. display the shape of the distribution of measurements.

D. reduce sampling bias.

E. represent the distribution of qualitative data.

29. When grouping a large sample of items into classes, the _____ is a better tool than the ____.

A. histogram, stem-and-leaf display

B. box-and-whiskers display, histogram

C. stem-and-leaf display, histogram

D. scatter plot, box-and-whiskers display

E. box-and-whiskers display, scatter plot

30. A _____ displays the frequency of each group with qualitative data and a _____ displays the frequency of each group with quantitative data.

A. histogram, stem-and-leaf display

B. bar chart, histogram

C. scatter plot, bar chart

D. stem-and-leaf display, pie chart

E. scatter plot, pie chart

31. A _____ shows the relationship between two quantitative variables.

A. box-and-whiskers display

B. bar chart

C. histogram

D. scatter plot

E. pie chart

32. In a given data set, the 25^{th} percentile is _____ equal to the lower hinge.

A. always

B. sometimes

C. never

33. An airline company is, on average, late 10 minutes for arrivals. If the variance for the lateness statistic is 9, then the coefficient of variation is _____.

A. 3

B. 300

C. 10

D. 90

E. 30

34. _____ and _____ are used to describe qualitative (categorical) data.

A. Stem-and- leaf displays; scatter plots.

B. Scatter plots; and box-and-whiskers displays

C. Box-and-whiskers displays; bar charts

D. Bar charts; pie charts

E. Pie charts; histograms

35. Which of the following is influenced the least by the occurrence of extreme values in a sample?

A. Mean

B. Median

C. Mode

D. Range

E. Variance

36. If a population distribution is positively skewed (i.e. skewed to the right), then, given a random sample from that population, one would expect that the _____.

A. median would be greater than the mean

B. mode would be equal to the mean

C. median would never equal the mode

D. median would be equal to the mean

E. median would be less than the mean

37. If a statistics course is determined by three exams. Exam 1 is worth 25% of the course grade. Exam 2 is worth 35% of the course grade. Exam 3 is worth 40% of the course grade. Calculate the term grade for a student with a 52% for the first exam, 63% for the second exam, and 75% for the third exam.

A. 45.75%

B. 65.05%

C. 55.25%

D. 36.35%

E. 63.00%

38. If the mean, median, and mode for a given population are all equal, then we know that its distribution is _____.

A. bimodal

B. skewed to the right

C. symmetric

D. skewed to the left

39. If one intends to compare the relative variation between two samples involving two different quantitative variables with different measurement scales, then the most appropriate way is to compare the _____ from the two samples.

A. standard deviations
B. variances
C. coefficients of variation
D. ranges
E. interquartile ranges

40. A disadvantage of using grouping (a frequency table) with sample data is that

A. calculations involving central tendency and variation are more complicated than central tendency and variation calculations based on ungrouped data.
B. the descriptive statistics are less precise than the descriptive statistics obtained using ungrouped data.
C. the interpretation of the grouped data descriptive statistics is meaningless.
D. it is much more difficult to summarize the information than it is with the ungrouped data.
E. it is more difficult to interpret a pie chart.

41. When developing a frequency distribution, the class intervals should be _____.

A. large.
B. small.
C. different lengths.
D. mutually exclusive.
E. of equal length.

42. Which of the following graphical tools is not used to study the shapes of distributions?

A. Stem-and-leaf display

B. Scatter plot

C. Histogram

D. Dot plot

E. Cumulative frequency distribution

43. For a bell-shaped distribution, score x would be considered an outlier if:

A. $x = 15$, mean = 20, standard deviation = 3

B. $x = 15$, mean = 50, standard deviation = 30

C. $x = 15$, mean = 25, standard deviation = 5

D. $x = 15$, mean = 10, standard deviation = 100

E. $x = 15$, mean = 50, standard deviation = 10

44. A quantity that measures the variation of a population or a sample relative to its mean is called the ____.

A. range

B. standard deviation

C. coefficient of variation

D. variance

E. interquartile range

45. Which of the following sample statistics is a measure of variation that is based only on the minimum and maximum values in a sample?

A. Range
B. Standard deviation
C. Variance
D. Interquartile range
E. Coefficient of variation

46. If there are 130 values in a data set, how many classes should be created for a frequency histogram?

A. 4
B. 5
C. 6
D. 7
E. 8

47. If there are 120 values in a data set, how many classes should be created for a frequency histogram?

A. 4
B. 5
C. 6
D. 7
E. 8

48. If there are 62 values in a data set, how many classes should be created for a frequency histogram?

A. 4

B. 5

C. 6

D. 7

E. 8

49. If there are 30 values in a data set, how many classes should be created for a frequency histogram?

A. 4

B. 5

C. 6

D. 7

E. 8

A CFO is looking at what percentage of a company's resources are spent on computing. The CFO samples companies in the pharmaceutical industry and developed the following stem-and-leaf display. The leaf unit is 0.1.

5	269
6	255568999
7	11224557789
8	001222458
9	02455679
10	1556
11	137
12	
13	255

50. What is the approximate shape of the distribution of the data?

A. Normal

B. Skewed to the right

C. Skewed to the left

D. Bimodal

E. Uniform

51. What is the smallest percent spent on computing?

A. 5.9

B. 5.6

C. 5.2

D. 5.02

E. 50.2

52. If a frequency histogram were to be created using these data, how many classes would you create?

A. 4

B. 5

C. 6

D. 7

E. 8

53. What would be the class length that would be used in creating a frequency histogram?

A. 1.4

B. 8.3

C. 1.2

D. 1.7

E. 0.9

54. What would be the first class interval for the frequency histogram?

A. 5.2 - 6.5

B. 5.2 - 6.0

C. 5.0 - 6.0

D. 5.2 - 6.6

E. 5.2 - 6.4

A local airport keeps track of the percentage of flights arriving within 15 minutes of their scheduled arrivals. The stem-and-leaf plot of the data for one year is below. The leaf unit is 0.1.

76	9
77	114
78	
79	07
80	88
81	2
82	1
83	88

55. What is the sample size?

A. 7

B. 9

C. 10

D. 11

E. 12

56. In developing a histogram of these data, how many classes would be used?

A. 4

B. 5

C. 6

D. 7

E. 8

57. What would be the class length for creating the frequency histogram?

A. 1.4

B. 0.8

C. 2.7

D. 1.7

E. 2.3

A company collected the ages from a random sample of its middle managers with the resulting frequency distribution shown below:

Class Interval	Frequency
20 to <25	8
25 to < 30	6
30 to <35	5
35 to <40	12
40 to < 45	15
45 to < 50	7

58. What would be the approximate shape of the relative frequency histogram?

A. Uniform

B. Normal

C. Bimodal

D. Skewed to the left

E. Skewed to the right

59. What is the relative frequency for the largest interval?

A. 0.132

B. 0.226

C. 0.231

D. 0.283

E. 0.288

60. What is the midpoint of the third class interval?

A. 22.5

B. 27.5

C. 32.5

D. 37.5

E. 42.5

In a statistic class, 10 scores were randomly selected with the following results were obtained:

74, 73, 77, 77, 71, 68, 65, 77, 67, 66

61. What is the mean?

A. 71.5

B. 72.0

C. 77.0

D. 71.0

E. 73.0

62. What is the median?

A. 71.5

B. 72.0

C. 77.0

D. 71.0

E. 73.0

63. What is the mode?

A. 71.5

B. 72.0

C. 77.0

D. 71.0

E. 73.0

The numbers of rooms for 15 homes recently sold were:

8, 8, 8, 5, 9, 8, 7, 6, 6, 7, 7, 7, 7, 9, 9

64. What is the mean?

A. 8.0

B. 7.0

C. 6.0

D. 9.0

E. 7.4

65. What is the median?

A. 8.0

B. 7.0

C. 6.0

D. 9.0

E. 7.4

66. What is the mode?

A. 8.0

B. 7.0

C. 6.0

D. 9.0

E. 7.4

The values given below are snow depths measured as part of a study of satellite observations and water resources.
19, 18, 12, 25, 22, 8, 8, 16

67. What is the mean?

A. 8

B. 23.5

C. 16

D. 17

E. 18

68. What is the median?

A. 8

B. 23.5

C. 16

D. 17

E. 18

69. What is the mode?

A. 8

B. 23.5

C. 16

D. 17

E. 18

In a hearing test, subjects estimate the loudness (in decibels) of sound, and the results are: 68, 67, 70, 71, 68, 75, 68, 62, 80, 73, 68

70. What is the mean?

A. 70

B. 75

C. 68

D. 71

E. 80

71. What is the median?

A. 70

B. 75

C. 68

D. 71

E. 80

72. What is the mode?

A. 70

B. 75

C. 68

D. 71

E. 80

The reaction time in seconds to a stop light of a group of adult men were found to be 0.74, 0.71, 0.41, 0.82, 0.74, 0.85, 0.99, 0.71, 0.57, 0.85, 0.57, 0.55

73. What is the mean?

A. 0.709

B. 0.710

C. 0.920

D. 0.725

E. 0.550

74. What is the median?

A. 0.709

B. 0.710

C. 0.920

D. 0.725

E. 0.550

75. What is the mode?

A. 0.709

B. 0.710

C. 0.920

D. 0.725

E. 0.550

In a rating of the satisfaction with their instructor, 13 students gave the following scores from a scale of 1 to 5:

3, 2, 1, 1, 5, 5, 4, 3, 3, 2, 4, 3, 3

76. What is the mean?

A. 3

B. 5

C. 2

D. 4

E. 3.25

77. What is the median?

A. 3

B. 5

C. 2

D. 4

E. 3.25

78. What is the mode?

A. 3

B. 5

C. 2

D. 4

E. 3.25

The company financial officer was interested in the average cost of PCs that had been purchased in the past six months. A random sample of the price of 10 computers was taken with the following results:
$3,250, $1,127, $2,995, $3,250, $3,445, $3,449, $1,482, $6,120, $3,009, $4,000

79. What is the mean?

A. 3447

B. 3213

C. 3250

D. 6120

E. 3445

80. What is the median?

A. 3447

B. 3213

C. 3250

D. 6120

E. 3445

81. What is the mode?

A. 3447

B. 3213

C. 3250

D. 6120

E. 3445

The local amusement park was interested in the average wait time at their most popular roller coaster at the peak park time (2 p.m.). They selected 13 patrons and had them get in line between 2 and 3 p.m. Each was given a stop watch to record the time they spent in line. The times recorded were as follows (in minutes):
118, 124, 108, 116, 99, 120, 148, 118, 119, 121, 45, 130, 118

82. What is the mean?

A. 114.15

B. 118

C. 148

D. 45

E. 115.5

83. What is the median?

A. 114.15

B. 118

C. 148

D. 45

E. 115.5

84. What is the mode?

A. 114.15

B. 118

C. 148

D. 45

E. 115.5

Quality control is an important issue at ACME Company which manufacturers light bulbs. In order to conduct testing of the life hours of their light bulbs, they randomly sampled nine light bulbs and measured how many hours they lasted.

378, 361, 350, 375, 200, 391, 375, 368, 321

85. What is the mean?

A. 375

B. 368

C. 389.9

D. 200

E. 346.6

86. What is the median?

A. 375

B. 368

C. 389.9

D. 200

E. 346.6

87. What is the mode?

A. 375

B. 368

C. 389.9

D. 200

E. 346.6

Twenty students were randomly selected from a business statistics course and were asked to report the number of times that they had eaten a meal at the university's cafeteria within the past month. Below are the values reported:
7, 8, 10, 11, 8, 6, 10, 9, 9, 8, 13, 12, 8, 11, 11, 14, 8, 7, 10, 12

88. What is the mean?

A. 8

B. 9.6

C. 9.5

D. 10.5

E. 9

89. What is the median?

A. 8

B. 9.6

C. 9.5

D. 10.5

E. 9

90. What is the mode?

A. 8

B. 9.6

C. 9.5

D. 10.5

E. 9

91. Find the coefficient of variation for an IQ test with a mean of 100 and a standard deviation of 15.

A. 15.0

B. 6.7

C. 0.15

D. 1.5

E. 0.67

92. Find the *z*-score for an IQ test score of 142 when the mean is 100 and the standard deviation is 15.

A. 42

B. 2.8

C. 18.78

D. 1.27

E. -2.8

93. Find the *z*-score for an IQ test score of 92.2 when the mean is 100 and the standard deviation is 15.

A. 0.53

B. 0.77

C. -0.77

D. -0.52

E. -8.00

94. Find the *z*-score for an IQ test score of 118 when the mean is 100 and the standard deviation is 15.

A. 1.2

B. 1.0

C. 18.0

D. -1.03

E. -1.2

95. Find the *z*-score for an IQ test score of 125 when the mean is 100 and the standard deviation is 15.

A. 25

B. 1.1

C. 1.67

D. -1.1

E. -1.67

96. Using Chebyshev's Rule, find the interval that contains at least 93.75% of all measurements when mean = 2.549 and s = 1.828.

A. [-2.935, 8.033]

B. [-1.107, 6.205]

C. [-26.699, 31.797]

D. [2.435, 2.663]

E. [-4.763, 9.861]

According to a survey of the top 10 employers in a major city, a worker spends an average of 413 minutes a day on the job. Suppose the standard deviation is 26.8 minutes and the time spent is approximately a normal distribution.

97. Within which interval will the times of approximately 68.26% of all workers fall?

A. [394.8, 431.2]

B. [386.2, 439.8]

C. [372.8, 453.2]

D. [359.4, 466.6]

E. [332.6, 493.4]

98. Within which interval will the times of approximately 95.44% of all workers fall?

A. [387.5, 438.5]

B. [386.2, 439.8]

C. [372.8, 453.2]

D. [359.4, 466.6]

E. [332.6, 493.4]

99. Within which interval will the times of approximately 99.73% of all workers fall?

A. [305.8, 520.2]

B. [386.2, 439.8]

C. [372.8, 453.2]

D. [359.4, 466.6]

E. [332.6, 493.4]

100. According to Chebyshev's Theorem, at least what percentage of measurements in a data set will be within two standard deviations of the mean?

A. 68%

B. 50%

C. 25%

D. 75%

E. 34%

101. According to Chebyshev's Theorem, at least what percentage of measurements in a data set will be within 2.5 standard deviations of the mean?

A. 16%

B. 40%

C. 68%

D. 60%

E. 84%

102. According to Chebyshev's Theorem, at least what percentage of measurements in a data set will be within 1.6 standard deviations of the mean?

A. 39%

B. 58%

C. 68%

D. 61%

E. 92%

103. According to Chebyshev's Theorem, at least what percentage of measurements in a data set will be within 3.2 standard deviations of the mean?

A. 90%

B. 95%

C. 84%

D. 97%

E. 10%

104. Consider the interval $\mu \pm k\sigma$ for some population. According to Chebyshev's theorem, what value of *k* would guarantee this interval would include at least 80% of the measurements in the population?

A. 5.0

B. 2.2

C. 2.5

D. 1.6

E. 2.0

In a statistic class, 10 scores were randomly selected with the following results were obtained (mean = 71.5):

74, 73, 77, 77, 71, 68, 65, 77, 67, 66

105.What is the range?

A. 22.72

B. 12.00

C. 4.77

D. 516.20

E. 144.00

106.What is the variance?

A. 22.72

B. 12.00

C. 4.77

D. 516.20

E. 144.00

107.What is the standard deviation?

A. 22.72

B. 12.00

C. 4.77

D. 516.20

E. 144.00

The numbers of rooms for 15 homes recently sold were (mean = 7.4):

8, 8, 8, 5, 9, 8, 7, 6, 6, 7, 7, 7, 7, 9, 9

108.What is the range?

A. 1.183

B. 1.400

C. 4.00

D. 16.00

E. 1.96

109.What is the variance?

A. 1.183

B. 1.400

C. 4.00

D. 16.00

E. 1.96

110.What is the standard deviation?

A. 1.183

B. 1.400

C. 4.00

D. 16.00

E. 1.96

The values given below are snow depths measured as part of a study of satellite observations and water resources (mean = 16).

19, 18, 12, 25, 22, 8, 8, 16

111.What is the range?

A. 39.14

B. 6.26

C. 17

D. 289

E. 18

112.What is the variance?

A. 39.14

B. 6.26

C. 17

D. 289

E. 18

113.What is the standard deviation?

A. 39.14

B. 6.26

C. 17

D. 289

E. 18

In a hearing test, subjects estimate the loudness (in decibels) of sound, and the results are (mean = 70):

68, 67, 70, 71, 68, 75, 68, 62, 80, 73, 68

114.What is the range?

A. 18

B. 4.73

C. 22.40

D. 324

E. 6.76

115.What is the variance?

A. 18

B. 4.73

C. 22.40

D. 324

E. 6.76

116.What is the standard deviation?

A. 18

B. 4.73

C. 22.40

D. 324

E. 6.76

The reaction time in seconds to a stop light for a group of adult men were found to be 0.74, 0.71, 0.41, 0.82, 0.74, 0.85, 0.99, 0.71, 0.57, 0.85, 0.57, 0.55 (mean = .709)

117.What is the range?

A. 0.026

B. 0.052

C. 0.580

D. 0.1613

E. 0.0007

118.What is the variance?

A. 0.026

B. 0.052

C. 0.580

D. 0.1613

E. 0.0007

119.What is the standard deviation?

A. 0.026

B. 0.052

C. 0.580

D. 0.1613

E. 0.0007

In a rating of the satisfaction with their instructor, 13 students gave the following scores from a scale of 1 to 5 (mean = 3):

3, 2, 1, 1, 5, 5, 4, 3, 3, 2, 4, 3, 3

120.What is the range?

A. 3

B. 4

C. 1.291

D. 1.667

E. 2.779

121.What is the variance?

A. 3

B. 4

C. 1.291

D. 1.667

E. 2.779

122.What is the standard deviation?

A. 3

B. 4

C. 1.291

D. 1.667

E. 2.779

The company financial officer was interested in the average cost of PCs that had been purchased in the past six months. A random sample of the price of 10 computers was taken with the following results (mean = $3,213):

$3,250, $1,127, $2,995, $3,250, $3,445, $3,449, $1,482, $6,120, $3,009, $4,000

123. What is the range?

A. 1359

B. 4993

C. 1846575

D. 3587

E. 1976454

124. What is the variance?

A. 1359

B. 4993

C. 1846575

D. 3587

E. 1976454

125.What is the standard deviation?

A. 1359

B. 4993

C. 1846575

D. 3587

E. 1976454

The local amusement park was interested in the average wait time at their most popular roller coaster at the peak park time (2 p.m.). They selected 13 patrons and had them get in line between 2 and 3 p.m. Each was given a stop watch to record the time they spent in line. The times recorded were as follows (in minutes) (mean = 114.15):
118, 124, 108, 116, 99, 120, 148, 118, 119, 121, 45, 130, 118

126.What is the range?

A. 103

B. 23.62

C. 557.97

D. 128.8

E. 115

127.What is the variance?

A. 103

B. 23.62

C. 557.97

D. 128.8

E. 115

128.What is the standard deviation?

A. 103

B. 23.62

C. 557.97

D. 128.8

E. 115

Quality control is an important issue at ACME Company which manufacturers light bulbs. In order to conduct testing of the life hours of their light bulbs, they randomly sampled nine light bulbs and measured how many hours they lasted (mean = 346.6).
378, 361, 350, 375, 200, 391, 375, 368, 321

129.What is the range?

A. 342.43

B. 3424.3

C. 58.5

D. 191

E. 10609

130.What is the variance?

A. 342.43

B. 3424.3

C. 58.5

D. 191

E. 10609

131.What is the standard deviation?

A. 342.43

B. 3424.3

C. 58.5

D. 191

E. 10609

Twenty students were randomly selected from the most recent graduating class at a Canadian university. The number of semesters they were enrolled was calculated (mean = 9.6)
7, 8, 10, 11, 8, 6, 10, 9, 9, 8, 13, 12, 8, 11, 11, 14, 8, 7, 10, 12

132.What is the range?

A. 8

B. 2.162

C. 9.5

D. 4.674

E. 21.846

133.What is the variance?

A. 8

B. 2.162

C. 9.5

D. 4.674

E. 21.846

134.What is the standard deviation?

A. 8

B. 2.162

C. 9.5

D. 4.674

E. 21.846

In a statistic class, 10 scores were randomly selected with the following results were obtained:

74, 73, 77, 77, 71, 68, 65, 77, 67, 66

135.What is the 90th percentile?

A. 77

B. 73

C. 74

D. 67

E. 65.9

136.What is the third quartile?

A. 65.9

B. 67.3

C. 66.75

D. 73.85

E. 77.0

137.What is the first quartile?

A. 65.9

B. 67.3

C. 67.0

D. 73.85

E. 77.0

138.What is the 10^{th} percentile?

A. 65.5

B. 67.3

C. 66.75

D. 73.85

E. 77.0

139.What is the 65^{th} percentile?

A. 65.9

B. 67.3

C. 66.75

D. 74.0

E. 77.0

140.What is the *IQR*?

A. 12.00

B. 5.25

C. 10.00

D. 5.00

E. 11.00

141.What are the inner fences?

A. 15.375, 30.75

B. 82.125, 92.375

C. 97.50, 107.75

D. 52.00, 92.00

E. 35.95, 107.75

142.What are the outer fences?

A. 15.375, 30.75

B. 51.375, 92.375

C. 37.00, 107.00

D. 82.125, 92.375

E. 97.50, 107.75

The numbers of rooms for 15 home recently sold were;

8, 8, 8, 5, 9, 8, 7, 6, 6, 7, 7, 7, 7, 9, 9

143.What is the 90^{th} percentile?

A. 9

B. 8

C. 7

D. 6

E. 5

144.What is the third quartile?

A. 9

B. 8

C. 7

D. 6

E. 5

145.What is the first quartile?

A. 9

B. 8

C. 7

D. 6

E. 5

146.What is the 10^{th} percentile?

A. 9

B. 8

C. 7

D. 6

E. 5

147.What is the 65^{th} percentile?

A. 9

B. 8

C. 7

D. 6

E. 5

148.What is the *IQR*?

A. 15

B. 1.5

C. 3

D. 4

E. 1

149.What are the inner fences?

A. 4, 11

B. 8.5, 9.5

C. 5.5, 9.5

D. 10, 9.5

E. 5.5, 10

150.What are the outer fences?

A. 5.5, 9.5

B. 4, 11

C. 8.5, 9.5

D. 10, 9.5

E. 5.5, 10

The values given below are snow depths measured as part of a study of satellite observations and water resources.

19, 18, 12, 25, 22, 8, 8, 16

151.What is the 90^{th} percentile?

A. 8

B. 25

C. 18.55

D. 9

E. 21.25

152.What is the third quartile?

A. 8

B. 22.9

C. 18.55

D. 9

E. 20.5

153.What is the first quartile?

A. 8

B. 22.9

C. 18.55

D. 10

E. 21.25

154.What is the 10^{th} percentile?

A. 8

B. 22.9

C. 18.55

D. 9

E. 21.25

155.What is the 65^{th} percentile?

A. 8

B. 22.9

C. 19

D. 9

E. 21.25

156.What is the *IQR*?

A. 10.5

B. 18.375

C. 36.75

D. 21.25

E. 30.25

157.What are the inner fences?

A. 27.375, 39.625

B. -5.75, 36.25

C. -27.75, 58.00

D. 45.75, 58.00

E. 18.375, 36.75

158.What are the outer fences?

A. -9.375, 39.625

B. -21.5, 52.00

C. 27.375, 39.625

D. 45.75, 58.00

E. 18.375, 36.75

In a hearing test, subjects estimate the loudness (in decibels) of sound, and the results are; 68, 67, 70, 71, 68, 75, 68, 62, 80, 73, 68

159.What is the 90th percentile?

A. 73

B. 68

C. 70.5

D. 67

E. 75

160.What is the third quartile?

A. 73

B. 68

C. 70.5

D. 67

E. 75

161.What is the first quartile?

A. 73

B. 68

C. 70.5

D. 67

E. 75

162.What is the 10^{th} percentile?

A. 73

B. 68

C. 70.5

D. 67

E. 75

163.What is the 65^{th} percentile?

A. 73

B. 68

C. 71

D. 67

E. 75

164.What is the *IQR*?

A. 18

B. 6

C. 5

D. 7.5

E. 15

165.What are the inner fences?

A. 75.5, 80.5

B. 83, 88

C. 60.5, 80.5

D. 53, 88

E. 7.5, 15

166.What are the outer fences?

A. 60.5, 80.5

B. 75.5, 80.5

C. 53, 88

D. 83, 88

E. 7.5, 15

The reaction time (in seconds) to a stop at a red light for a group of adult men was found to be 0.74, 0.71, 0.41, 0.82, 0.74, 0.85, 0.99, 0.71, 0.57, 0.85, 0.57, 0.55

167.What is the 90^{th} percentile?

A. 0.752

B. 0.552

C. 0.85

D. 0.8425

E. 0.57

168.What is the third quartile?

A. 0.752

B. 0.552

C. 0.85

D. 0.835

E. 0.57

169.What is the first quartile?

A. 0.752

B. 0.552

C. 0.85

D. 0.8425

E. 0.57

170.What is the 10^{th} percentile?

A. 0.752

B. 0.55

C. 0.85

D. 0.8425

E. 0.57

171. What is the 65^{th} percentile?

A. 0.74

B. 0.552

C. 0.85

D. 0.8425

E. 0.57

172. What is the *IQR*?

A. 265

B. 8175

C. 40875

D. 57

E. 8425

173. What are the inner fences?

A. 97875, 1.25125

B. 3875, 1.66

C. -.2475, 1.66

D. 40875, .8175

E. 1725, 1.2325

174.What are the outer fences?

A. -.225, 1.63

B. 16125, 1.25125

C. 97875, 1.25125

D. 1.3875, 1.66

E. 40875, .8175

In a rating of the satisfaction with their instructor, 13 students gave the following scores from a scale of 1 to 5;

3, 2, 1, 1, 5, 5, 4, 3, 3, 2, 4, 3, 3

175.What is the 90^{th} percentile?

A. 1.2

B. 2

C. 3

D. 4

E. 5

176.What is the third quartile?

A. 1.2

B. 2

C. 3

D. 4

E. 4.8

177.What is the first quartile?

A. 1.2

B. 2

C. 3

D. 4

E. 4.8

178.What is the 10^{th} percentile?

A. 1

B. 2

C. 3

D. 4

E. 4.8

179.What is the 65^{th} percentile?

A. 1.2

B. 2

C. 3

D. 4

E. 4.8

180.What is the *IQR*?

A. 2

B. 6

C. 3

D. 4

E. 1

181.What are the inner fences?

A. -1, 7

B. -4, 10

C. 5, 7

D. 8, 10

E. 3, 6

182.What are the outer fences?

A. -1, 7

B. -4, 10

C. 5, 7

D. 8, 10

E. 3, 6

The company financial officer was interested in the average cost of PCs that had been purchased in the past six months. A random sample of the price of 10 computers was taken with the following results;

$3,250, $1,127, $2,995, $3,250, $3,445, $3,449, $1,482, $6,120, $3,009, $4,000

183. What is the 90th percentile?

A. $1,446.5

B. $2,617

C. $3,415.75

D. $3,587

E. $5,060

184. What is the third quartile?

A. $1,446.5

B. $2,617

C. $3,415.75

D. $3,449

E. $4,212

185.What is the first quartile?

A. $1,446.5

B. $2,995

C. $3,415.75

D. $3,587

E. $4,212

186.What is the 10th percentile?

A. $1,304.50

B. $2,617

C. $3,415.75

D. $3,587

E. $4,212

187.What is the 65th percentile?

A. $1,446.5

B. $2,617

C. $3,445

D. $3,587

E. $4,212

188.What is the *IQR*?

A. 1455

B. 454

C. 2910

D. 4993

E. 6204

189.What are the inner fences?

A. 1455, 2910

B. 4072, 5042

C. 5527, 6497

D. 2314, 4130

E. -293, 6497

190.What are the outer fences?

A. 1455, 2910

B. 4072, 5042

C. 5527, 6497

D. 1162, 5042

E. 1633, 4811

The local amusement park was interested in the average wait time at their most popular roller coaster at the peak park time (2 p.m.). They selected 13 patrons and had them get in line between 2 and 3 p.m. Each was given a stop watch to record the time they spent in line. The times recorded were as follows (in minutes)

118, 124, 108, 116, 99, 120, 148, 118, 119, 121, 45, 130, 118

191. What is the 90^{th} percentile?

A. 100.8

B. 119.8

C. 130

D. 112

E. 122.5

192. What is the third quartile?

A. 100.8

B. 119.8

C. 128.8

D. 112

E. 121

193.What is the first quartile?

A. 100.8

B. 119.8

C. 128.8

D. 116

E. 122.5

194.What is the 10^{th} percentile?

A. 99

B. 119.8

C. 128.8

D. 112

E. 122.5

195.What is the 65^{th} percentile?

A. 100.8

B. 120

C. 128.8

D. 112

E. 122.5

196.What is the *IQR*?

A. 21.00

B. 5

C. 15.75

D. 31.50

E. 11.50

197.What are the inner fences?

A. 108.50, 128.50

B. 80.50, 154.00

C. 127.75, 138.25

D. 143.50, 154.00

E. 15.75, 31.50

198.What are the outer fences?

A. 96.25, 138.25

B. 101.00, 136.00

C. 127.75, 138.25

D. 143.50, 154.00

E. 15.75, 31.50

Quality control is an important issue at ACME Company which manufacturers light bulbs. In order to conduct testing of the life hours of their light bulbs, they randomly sampled nine light bulbs and measured how many hours they lasted.

378, 361, 350, 375, 200, 391, 375, 368, 321

199. What is the 90^{th} percentile?

A. 335.5

B. 370.5

C. 391

D. 296.8

E. 375

200. What is the third quartile?

A. 335.5

B. 370.5

C. 380.6

D. 296.8

E. 375

201.What is the first quartile?

A. 350

B. 370.5

C. 380.6

D. 296.8

E. 375

202.What is the 10^{th} percentile?

A. 335.5

B. 370.5

C. 380.6

D. 200

E. 375

203.What is the 65^{th} percentile?

A. 335.5

B. 370.5

C. 380.6

D. 296.8

E. 375

204.What is the *IQR*?

A. 25

B. 22

C. 61.50

D. 191

E. 82

205.What are the inner fences?

A. 312.5, 412.5

B. 212.5, 499.5

C. 397.0, 438.0

D. 458.5, 499.5

E. 61.5, 123.0

206.What are the outer fences?

A. 274.0, 438.0

B. 275.0, 450.0

C. 397.0, 438.0

D. 458.5, 499.5

E. 61.5, 123.0

Twenty students were randomly selected from a business statistics course and were asked to report the number of times that they had eaten a meal at the university's cafeteria within the past month. Below are the values reported:

7, 8, 10, 11, 8, 6, 10, 9, 9, 8, 13, 12, 8, 11, 11, 14, 8, 7, 10, 12

207. What is the 90^{th} percentile?

A. 7

B. 10.35

C. 12.5

D. 11

E. 8

208. What is the third quartile?

A. 7

B. 10.35

C. 12.1

D. 11

E. 8

209.What is the first quartile?

A. 7

B. 10.35

C. 12.1

D. 11

E. 8

210.What is the 10^{th} percentile?

A. 7

B. 10.35

C. 12.1

D. 11

E. 8

211.What is the 65^{th} percentile?

A. 7

B. 10.5

C. 12.1

D. 11

E. 8

212.What is the *IQR*?

A. 3

B. 8

C. 3.5

D. 11

E. 4.5

213.What are the inner fences?

A. 17, 20

B. 3.5, 15.5

C. 12.5, 15.5

D. -1, 20

E. 4.5, 9.0

214.What are the outer fences?

A. 17, 20

B. -1, 20

C. 3.5, 15.5

D. 12.5, 15.5

E. 4.5, 9.0

In a survey of 550 randomly-selected business statistic students were surveyed on their impressions of their course, instructor, and textbook. The results are as follows:

Rate the overall quality of your course.		
	Excellent	154
	Good	187
	Fair	71
	Poor	138
How effective was your instructor?		
	Very effective	75
	Somewhat effective	220
	Somewhat ineffective	155
	Very ineffective	100
How easy was it to read and understand the textbook?		
	Very easy	21
	Easy	83
	Hard	361
	Very hard	85

Use the above results to answer the following questions:

Compute a point estimate of the proportion of all college statistic students who:

215.Think their instructor was "very effective"

A. 0.136

B. 0.536

C. 0.182

D. 0.280

E. 0.014

216.Feel their textbook is not "easy" or "very easy"

A. 0.189

B. 0.811

C. 0.009

D. 0.656

E. 0.151

217.Think the quality of the course was "fair"

A. 0.251

B. 0.620

C. 0.129

D. 0.871

E. 0.340

218.Think that they had a "very ineffective" or "somewhat ineffective" instructor

A. 0.282

B. 0.136

C. 0.182

D. 0.280

E. 0.464

219. Of the students who thought their textbook was very hard to read, 50 also thought that the quality of the course was "poor". What proportion of students who think that their textbook was "hard" also thought their course was "poor".

A. 0.588

B. 0.155

C. 0.091

D. 0.251

E. 0.616

The 550 students answered an additional question with the following results based on their rating of their instructor:

	Very or Somewhat Effective	Very or Somewhat Ineffective
Final Grade		
A	190	85
B	75	120
C	20	17
D	9	18
F	1	15

220. What proportion of the students who rated their instructor as very or somewhat effective received a B or better in the class?

A. 0.345

B. 0.254

C. 0.482

D. 0.898

E. 0.644

221.What proportion of all 550 students received less than a C?

A. 0.03

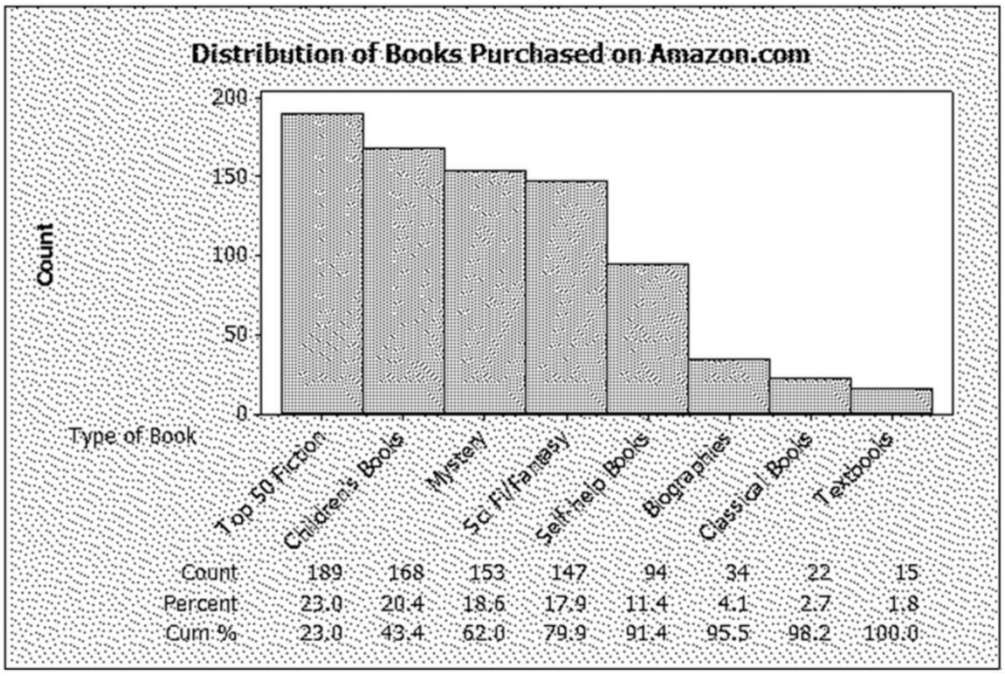
B. 0.06

C. 0.08

D. 0.13

E. 0.15

822 customers were randomly selected from those who had recently bought a book over the internet. The chart below shows the breakdown of the classification of the book type:



222.What percentage of the books purchased were either mystery or science fiction/fantasy?

A. 18.61

B. 36.50

C. 17.88

D. 24.33

E. 22.99

223.What proportion of the books purchased were self-help books?

A. 0.1144

B. 11.44

C. 1.82

D. 0.0182

E. 0.940

224.What percentage of books were in the top two categories?

A. 22.99

B. 20.44

C. 4.50

D. 43.43

E. 4343

225.A graphical display of categorical data made up of vertical or horizontal bars is called a _____.

_____

226. A measurement located between the inner and outer fences of a box-and-whisker display is a(n) _____.

_____

227. A measurement located outside the outer fences of a box-and-whisker display is a(n) _____.

_____

228. A graphical portrayal of a data set that divides the data into classes and gives the frequency of each class is a(n) _____.

_____

229. Another name for the 50^{th} percentile is the _____.

_____

230. The measurement in a sample or a population that occurs most frequently is the _____.

_____

231. The average of the squared deviations of the individual population measurement from the population mean is the _____.

_____

232. If a process is able to consistently produce output that meets customer requirements (specifications), we say that it is a _____ process.

_____

233. Histograms and stem-and-leaf displays are used to visualize the distribution of _____ data.

_____

234. The difference between the largest and smallest measurements in a population or sample is the _____.

_____

235. A relative frequency curve having a long tail to the right is said to be _____ to the right.

_____

236. If the mean is greater than the median, then the distribution is skewed _____.

_____

237. The proportion of measurements in a class is called the _____ of that class.

_____

238. A histogram that tails out towards larger values is skewed _____.

_____

239.A histogram that tails out towards smaller values is skewed _____.

_____

240.The point estimate of the population _____ is the positive square root of the sample variance.

_____

241.The _____ is a quantity that measures the variation of a population or sample relative to its mean.

_____

242.A(n) _____ is a graphical display of categorical data made up of vertical or horizontal bars.

_____

243.What percent of a normal population is within 2 standard deviations of the mean?

244. Twenty students were randomly selected from a business statistics course and were asked to report the number of times that they had eaten a meal at the university's cafeteria within the past month. Below are the values reported: 7, 8, 10, 11, 8, 6, 10, 9, 9, 8, 13, 12, 8, 11, 11, 14, 8, 7, 10, 12. What is the 90^{th} percentile?

245. Compute the mean of the data 32,33,22,28,24,23,27,24,27,21.

246. Compute the median of the data 32,33,22,28,24,23,27,24,27,21.

247.Compute the mode(s) of the data 32,33,22,28,24,23,27,24,27,21.

248.Compute the range of the data: 16,18,23,21,17,16,24,23,9,17,11,16,13,10,15,14.

249.Compute the population variance of the data: 16,18,23,21,17,16,24,23,9,17,11,16,22,10,15,14.

250.Determine the sample mean of the data 5,4,8,6,1,0,2,6.

251.Determine the median of the data 2,4,6,8,10,12,14.

252.Determine the mode of the data 2,4,6,2,5,6,2,9,4,5,2,1.

253.Compute the sample standard deviation of the data 5,4,8,6,1,0,2,6.

254.What is the range of the following set of data: 3,7,2,1,8?

255.Calculate a one standard deviation tolerance interval for the data that has a sample mean of 28,475 and a standard deviation of 9,369.

256. Calculate a two standard deviation tolerance interval for the data that has a sample mean of 28,475 and a standard deviation of 9,369.

257. Calculate a three standard deviation tolerance interval for the data that has a sample mean of 28,475 and a standard deviation of 9,369.

258. If the median of a data set is 760 and the upper quartile is 950, and the lower quartile is 650, what is the interquartile range?

259. If the median of the data set is 40 and the upper quartile is 42 and the lower quartile is 37, what is the interquartile range?

260. Given a set of data with a mean of 150 and a standard deviation of 20. Using Chebyshev's Theorem, what is the minimum percentage of data between 110 and 190?

261. Given a set of data with mean of 150 and a standard deviation of 25. Using Chebyshev's Theorem, what is the minimum percentage of data between 75 and 225?

262.Determine the median of the data set 95,86,78,90,62,73,89,92,84,76.

263.Compute the sample standard deviation of the data set 6,4,2,1,4,1

264.If 50 of 500 sampled customers said they would make a purchase of a new TV set, what is the sample proportion?

265. Describe the shape of a population distribution, if the median is greater than the mean.

266. In a normally distributed population, what tolerance interval contains 68.26 percent of all measurements?

267. In a normally distributed population, what tolerance interval contains 95.44 percent of all measurements?

268. In a normally distributed population, what tolerance interval contains 99.73 percent of all measurements?

269. What are three important properties of any data set?

270. If specifications for a process are (1.6, 1.8), and a 99.73 percent tolerance interval is (1.62, 1.83), is the process capable?

271. The average lateness for one of the top airline companies is 10 minutes. The variance of the lateness measure is calculated as 9. What is the coefficient of variation?

272. The average lateness for one of the top airline companies is 10 minutes. The variance of the lateness measure is calculated as 9. An airplane arrived 13 minutes after the stated arrival time. Calculate the Z-score for this particular airplane's lateness.

The average life of Canadian women is 73.75 years and the standard deviation of the women's life expectancy in Canada is 6.5 years.

273. Using the Chebychev's theorem, determine the minimum percentage of women in Canada whose life expectancy is between 64 and 83.5 years.

274. Based on Chebychev's inequality determine the upper and lower bounds on the average life expectancy of the Canadian women such that at least 90% of all population is included.

275. The average lateness for one of the top airline companies is 10 minutes. The variance of the lateness measure is calculated as 9. An airplane arrived 8.5 minutes after the stated arrival time. Calculate the Z-score for this particular airplane's lateness.

The following table shows the Price-to-Earnings ratio for a Stereo equipment manufacturing company between 1998 and 2002.

Year	P/E Ratio
1998	12.4
1999	14.6
2000	11.1
2001	8.2
2002	6.8

276.Determine the percentage change in the P/E ratios from 1998 to 1999.

277.Determine the percentage change in the P/E ratios from 1999 to 2000.

278. The following table shows the annual percentage growth rate for a Stereo equipment manufacturing company between 1998 and 2002. The of the P/E ratios are also calculated and given below:

Year	Growth rate %
2007	17.74% (2006 – 2007)
2008	-23.97% (2007 – 2008)
2009	-26.13% (2008 – 2009)
2010	-17.07% (2009 – 2010)

Calculate the mean growth rate.

The following frequency table summarizes the ages of 64 shoppers at the local grocery store.

Age of the shopper	Frequency
15 – 23	10
24 – 32	21
33 – 41	10
42 – 50	8
51 – 59	5
60 – 68	6

279. Calculate the (approximate) sample mean for this data (mean for the grouped data).

280. The sample mean for the above frequency table is calculated as 36.25. Calculate the (approximate) sample variance and standard deviation for this data set.

A CFO is looking at the percentage of a company's resources are spent on computing. The CFO samples companies in the pharmaceutical industry and developed the following stem-and-leaf display.

5	269
6	255568999
7	11224557789
8	001222458
9	02455679
10	1556
11	137
12	
13	255

281.What is the approximate shape of the distribution of the data?

282.What is the smallest percent spent on computing?

283.If a frequency histogram were to be created using these data, how many classes would you create?

284. Personnel managers usually want to know where a job applicant ranked in an entrance test for their company. With a score of 3.83, Michelle Robinson ranked above the 93rd percentile of the other applicants. What is the percentile rank of an applicant whose score was the median value?

285. The Rivertown city council is attempting to choose one of two sites (A or B) as the location for its new emergency facility. After the new emergency facility becomes available for service, the current emergency facility will be shut down. The project manager has estimated the following response times in minutes from each of the proposed sites to the four areas that must be served by the emergency facility.

	Area Served			
Proposed Site	1	2	3	4
A	5.2	4.4	3.6	6.5
B	6.0	7.4	3.4	4.0

The number of emergency runs from the current emergency facility to each of the four areas over the past year is as follows:

Area	1	2	3	4
Number of runs	150	65	175	92

Compute the weighted mean response time from both proposed locations and determine which proposed site should be selected for the new emergency facility.

286.Consider the following data:

1.	11.5	6.	13.7	11.	11	16.	14.5
2.	13.5	7.	14	12.	13	17.	15.5
3.	12.5	8.	12	13.	16.7	18.	13
4.	15.2	9.	12.7	14.	12.5	19.	18.2
5.	14.7	10.	12.5	15.	11.5	20.	11.7

(a) Create a stem and leaf display for the sample.

(b) Describe the shape of the stem and leaf display.

(c) What is the mode?

(d) What is the media?

Chapter 2 Key

1. A stem-and-leaf display is a graphical portrayal of a data set that shows the data set's overall pattern of variation.

TRUE

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #1
Difficulty: Medium
Learning Objective: 02-01 Explain what is demonstrated by a stem-and-leaf display that you have constructed

2. The median is the measure of central tendency that divides a population or sample into four equal parts.

FALSE

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #2
Difficulty: Easy
Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

3. The population mean is the average of the population measurements.

TRUE

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #3
Difficulty: Easy
Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

4. The mode is the measurement in a sample or population that occurs most frequently.

TRUE

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #4

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

5. The population mean is a point estimate of the sample mean.

FALSE

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #5

Difficulty: Medium

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

6. The median is said to be resistant to extreme values.

TRUE

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #6

Difficulty: Medium

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

7. The range of set of measurements is the largest measurement plus the small measurement.

FALSE

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #7

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

8. The population variance is the average of the squared deviations of the individual population measurements from the population mean.

TRUE

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #8
Difficulty: Medium
Learning Objective: 02-07 Compute the variance and standard deviation from raw data

9. In a symmetric population, the median equals the mean.

TRUE

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #9
Difficulty: Easy
Learning Objective: 02-04 Differentiate between a symmetrical distribution and a positively or negatively skewed distribution

10. It is appropriate to use the Empirical Rule to describe a population that is extremely skewed.

FALSE

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #10
Difficulty: Medium
Learning Objective: 02-04 Differentiate between a symmetrical distribution and a positively or negatively skewed distribution

11. The median is the value below which approximately 50 percent of the measurements lie.

TRUE

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #11
Difficulty: Easy
Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

12. An independent variable is a variable that can be used to describe, predict, or control a dependent variable.

TRUE

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #12
Difficulty: Medium
Learning Objective: N/A

13. The relative frequency is the frequency of a class divided by the total number of measurements.

TRUE

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #13
Difficulty: Medium
Learning Objective: 02-02 Describe how a histogram is constructed

14. The box-and-whiskers display is a graphical portrayal of data sets that depict both the central tendency and variability of the data.

TRUE

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #14
Difficulty: Medium
Learning Objective: N/A

15. When establishing the classes for a frequency table it is generally agreed that the more classes you use the better your frequency table will be.

FALSE

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #15

Difficulty: Easy

Learning Objective: 02-02 Describe how a histogram is constructed

16. If there are 7 classes in a frequency distribution, then the fourth class will always contain the median.

FALSE

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #16

Difficulty: Medium

Learning Objective: 02-02 Describe how a histogram is constructed

17. A Pareto chart is a type of histogram.

FALSE

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #17

Difficulty: Medium

Learning Objective: 02-03 Identify when a histogram should be used

18. Range is a better measure of variation than standard deviation.

FALSE

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #18

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

19. A normal population has 99.73 percent of the population measurements within _____ standard deviations of the mean.

A. one

B. two

C. three

D. four

E. five

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #19

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

20. A number calculated using the sample measurements that describes some aspect of the sample is a sample _____.

A. mean

B. variance

C. statistic

D. parameter

E. scale

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #20

Difficulty: Medium

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

21. All of the following can be used to describe quantitative data with the exception of a _____.

A. histogram

B. stem-and-leaf display

C. dot plot

D. pie chart

E. scatter plot

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #21

Difficulty: Medium

Learning Objective: 02-01 Explain what is demonstrated by a stem-and-leaf display that you have constructed

Learning Objective: 02-03 Identify when a histogram should be used

22. All of the following are measures of central tendency except the _____.

A. range

B. mode

C. mean

D. median

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #22

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

23. A measurement that is separated from most of the other measurements is a(n) _____.

A. absolute extreme

B. outlier

C. mode

D. quartile

E. median

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #23

Difficulty: Easy

Learning Objective: 02-05 Define the term outlier

24. Which of the following graphs is used to summarize qualitative data?

A. Histogram

B. Bar Chart

C. Time series plot

D. Stem-and-leaf display

E. Scatter plot

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #24

Difficulty: Medium

Learning Objective: N/A

25. Which percentile describes the first quartile, Q1?

A. 25^{th}

B. 50^{th}

C. 75^{th}

D. 100^{th}

E. 125^{th}

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #25

Difficulty: Easy

Learning Objective: N/A

26. Which percentile describes the third quartile, Q3?

A. 25^{th}

B. 50^{th}

C. 75^{th}

D. 100^{th}

E. 125^{th}

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #26

Difficulty: Easy

Learning Objective: N/A

27. A plot of the values of a dependent variable *y* versus the values of an independent variable *x* is a _____ plot.

A. runs

B. scatter

C. dot

D. time series

E. box

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #27

Difficulty: Medium

Learning Objective: N/A

28. A stem-and-leaf display is best used to _____

A. provide a point estimate of the variability in the population.

B. provide a point estimate of the central tendency in the population.

C. display the shape of the distribution of measurements.

D. reduce sampling bias.

E. represent the distribution of qualitative data.

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #28

Difficulty: Medium

Learning Objective: 02-01 Explain what is demonstrated by a stem-and-leaf display that you have constructed

29. When grouping a large sample of items into classes, the _____ is a better tool than the ____.

A. histogram, stem-and-leaf display

B. box-and-whiskers display, histogram

C. stem-and-leaf display, histogram

D. scatter plot, box-and-whiskers display

E. box-and-whiskers display, scatter plot

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #29

Difficulty: Medium

Learning Objective: 02-01 Explain what is demonstrated by a stem-and-leaf display that you have constructed

Learning Objective: 02-03 Identify when a histogram should be used

30. A _____ displays the frequency of each group with qualitative data and a _____ displays the frequency of each group with quantitative data.

A. histogram, stem-and-leaf display

B. bar chart, histogram

C. scatter plot, bar chart

D. stem-and-leaf display, pie chart

E. scatter plot, pie chart

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #30

Difficulty: Medium

Learning Objective: 02-03 Identify when a histogram should be used

31. A _____ shows the relationship between two quantitative variables.

A. box-and-whiskers display

B. bar chart

C. histogram

D. scatter plot

E. pie chart

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #31

Difficulty: Medium

Learning Objective: N/A

32. In a given data set, the 25^{th} percentile is _____ equal to the lower hinge.

A. always

B. sometimes

C. never

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #32

Difficulty: Hard

Learning Objective: N/A

33. An airline company is, on average, late 10 minutes for arrivals. If the variance for the lateness statistic is 9, then the coefficient of variation is _____.

A. 3

B. 300

C. 10

D. 90

E. 30

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #33

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

34. _____ and _____ are used to describe qualitative (categorical) data.

A. Stem-and- leaf displays; scatter plots.

B. Scatter plots; and box-and-whiskers displays

C. Box-and-whiskers displays; bar charts

D. Bar charts; pie charts

E. Pie charts; histograms

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #34

Difficulty: Medium

Learning Objective: N/A

35. Which of the following is influenced the least by the occurrence of extreme values in a sample?

A. Mean

B. Median

C. Mode

D. Range

E. Variance

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #35

Difficulty: Medium

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

36. If a population distribution is positively skewed (i.e. skewed to the right), then, given a random sample from that population, one would expect that the _____.

A. median would be greater than the mean

B. mode would be equal to the mean

C. median would never equal the mode

D. median would be equal to the mean

E. median would be less than the mean

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #36

Difficulty: Medium

Learning Objective: 02-04 Differentiate between a symmetrical distribution and a positively or negatively skewed distribution

37. If a statistics course is determined by three exams. Exam 1 is worth 25% of the course grade. Exam 2 is worth 35% of the course grade. Exam 3 is worth 40% of the course grade. Calculate the term grade for a student with a 52% for the first exam, 63% for the second exam, and 75% for the third exam.

A. 45.75%

B. 65.05%

C. 55.25%

D. 36.35%

E. 63.00%

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #37

Difficulty: Medium

Learning Objective: N/A

38. If the mean, median, and mode for a given population are all equal, then we know that its distribution is _____.

A. bimodal

B. skewed to the right

C. symmetric

D. skewed to the left

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #38

Difficulty: Medium

Learning Objective: 02-04 Differentiate between a symmetrical distribution and a positively or negatively skewed distribution

39. If one intends to compare the relative variation between two samples involving two different quantitative variables with different measurement scales, then the most appropriate way is to compare the _____ from the two samples.

A. standard deviations
B. variances
C. coefficients of variation
D. ranges
E. interquartile ranges

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #39
Difficulty: Medium
Learning Objective: 02-07 Compute the variance and standard deviation from raw data

40. A disadvantage of using grouping (a frequency table) with sample data is that

A. calculations involving central tendency and variation are more complicated than central tendency and variation calculations based on ungrouped data.
B. the descriptive statistics are less precise than the descriptive statistics obtained using ungrouped data.
C. the interpretation of the grouped data descriptive statistics is meaningless.
D. it is much more difficult to summarize the information than it is with the ungrouped data.
E. it is more difficult to interpret a pie chart.

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #40
Difficulty: Medium
Learning Objective: N/A

41. When developing a frequency distribution, the class intervals should be _____.

A. large.

B. small.

C. different lengths.

D. mutually exclusive.

E. of equal length.

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #41

Difficulty: Hard

Learning Objective: 02-02 Describe how a histogram is constructed

42. Which of the following graphical tools is not used to study the shapes of distributions?

A. Stem-and-leaf display

B. Scatter plot

C. Histogram

D. Dot plot

E. Cumulative frequency distribution

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #42

Difficulty: Medium

Learning Objective: 02-01 Explain what is demonstrated by a stem-and-leaf display that you have constructed

Learning Objective: 02-03 Identify when a histogram should be used

43. For a bell-shaped distribution, score x would be considered an outlier if:

A. x = 15, mean = 20, standard deviation = 3

B. x = 15, mean = 50, standard deviation = 30

C. x = 15, mean = 25, standard deviation = 5

D. x = 15, mean = 10, standard deviation = 100

E. x = 15, mean = 50, standard deviation = 10

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #43

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

44. A quantity that measures the variation of a population or a sample relative to its mean is called the ____.

A. range

B. standard deviation

C. coefficient of variation

D. variance

E. interquartile range

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #44

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

45. Which of the following sample statistics is a measure of variation that is based only on the minimum and maximum values in a sample?

A. Range

B. Standard deviation

C. Variance

D. Interquartile range

E. Coefficient of variation

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #45

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

46. If there are 130 values in a data set, how many classes should be created for a frequency histogram?

A. 4

B. 5

C. 6

D. 7

E. 8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #46

Difficulty: Medium

Learning Objective: 02-02 Describe how a histogram is constructed

47. If there are 120 values in a data set, how many classes should be created for a frequency histogram?

A. 4

B. 5

C. 6

D. 7

E. 8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #47

Difficulty: Medium

Learning Objective: 02-02 Describe how a histogram is constructed

48. If there are 62 values in a data set, how many classes should be created for a frequency histogram?

A. 4

B. 5

C. 6

D. 7

E. 8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #48

Difficulty: Medium

Learning Objective: 02-02 Describe how a histogram is constructed

49. If there are 30 values in a data set, how many classes should be created for a frequency histogram?

A. 4

B. 5

C. 6

D. 7

E. 8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #49

Difficulty: Medium

Learning Objective: 02-02 Describe how a histogram is constructed

A CFO is looking at what percentage of a company's resources are spent on computing. The CFO samples companies in the pharmaceutical industry and developed the following stem-and-leaf display. The leaf unit is 0.1.

5	269
6	255568999
7	11224557789
8	001222458
9	02455679
10	1556
11	137
12	
13	255

Bowerman - Chapter 02

50. What is the approximate shape of the distribution of the data?

A. Normal

B. Skewed to the right

C. Skewed to the left

D. Bimodal

E. Uniform

Bowerman - Chapter 02 #50

Difficulty: Medium

Learning Objective: 02-01 Explain what is demonstrated by a stem-and-leaf display that you have constructed

51. What is the smallest percent spent on computing?

A. 5.9

B. 5.6

C. 5.2

D. 5.02

E. 50.2

Bowerman - Chapter 02 #51

Difficulty: Medium

Learning Objective: 02-01 Explain what is demonstrated by a stem-and-leaf display that you have constructed

52. If a frequency histogram were to be created using these data, how many classes would you create?

A. 4

B. 5

C. 6

D. 7

E. 8

Bowerman - Chapter 02 #52

Difficulty: Medium

Learning Objective: 02-02 Describe how a histogram is constructed

53. What would be the class length that would be used in creating a frequency histogram?

A. 1.4

B. 8.3

C. 1.2

D. 1.7

E. 0.9

Bowerman - Chapter 02 #53

Difficulty: Medium

Learning Objective: 02-02 Describe how a histogram is constructed

54. What would be the first class interval for the frequency histogram?

A. 5.2 - 6.5

B. 5.2 - 6.0

C. 5.0 - 6.0

D. 5.2 - 6.6

E. 5.2 - 6.4

Bowerman - Chapter 02 #54

Difficulty: Medium

Learning Objective: 02-02 Describe how a histogram is constructed

A local airport keeps track of the percentage of flights arriving within 15 minutes of their scheduled arrivals. The stem-and-leaf plot of the data for one year is below. The leaf unit is 0.1.

76	9
77	114
78	
79	07
80	88
81	2
82	1
83	88

Bowerman - Chapter 02

55. What is the sample size?

A. 7

B. 9

C. 10

D. 11

E. 12

Bowerman - Chapter 02 #55

Difficulty: Medium

Learning Objective: 02-01 Explain what is demonstrated by a stem-and-leaf display that you have constructed

56. In developing a histogram of these data, how many classes would be used?

A. 4

B. 5

C. 6

D. 7

E. 8

Bowerman - Chapter 02 #56

Difficulty: Medium

Learning Objective: 02-02 Describe how a histogram is constructed

57. What would be the class length for creating the frequency histogram?

A. 1.4

B. 0.8

C. 2.7

D. 1.7

E. 2.3

Bowerman - Chapter 02 #57

Difficulty: Medium

Learning Objective: 02-02 Describe how a histogram is constructed

A company collected the ages from a random sample of its middle managers with the resulting frequency distribution shown below:

Class Interval	Frequency
20 to <25	8
25 to < 30	6
30 to <35	5
35 to <40	12
40 to < 45	15
45 to < 50	7

Bowerman - Chapter 02

58. What would be the approximate shape of the relative frequency histogram?

A. Uniform

B. Normal

C. Bimodal

D. Skewed to the left

E. Skewed to the right

Bowerman - Chapter 02 #58

Difficulty: Hard

Learning Objective: 02-02 Describe how a histogram is constructed

59. What is the relative frequency for the largest interval?

A. 0.132

B. 0.226

C. 0.231

D. 0.283

E. 0.288

Bowerman - Chapter 02 #59

Difficulty: Hard

Learning Objective: 02-02 Describe how a histogram is constructed

60. What is the midpoint of the third class interval?

A. 22.5

B. 27.5

C. 32.5

D. 37.5

E. 42.5

Bowerman - Chapter 02 #60

Difficulty: Hard

Learning Objective: 02-02 Describe how a histogram is constructed

In a statistic class, 10 scores were randomly selected with the following results were obtained:

74, 73, 77, 77, 71, 68, 65, 77, 67, 66

Bowerman - Chapter 02

61. What is the mean?

A. 71.5

B. 72.0

C. 77.0

D. 71.0

E. 73.0

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #61

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

62. What is the median?

A. 71.5

B. 72.0

C. 77.0

D. 71.0

E. 73.0

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #62

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

63. What is the mode?

A. 71.5

B. 72.0

C. 77.0

D. 71.0

E. 73.0

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #63

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

The numbers of rooms for 15 homes recently sold were:

8, 8, 8, 5, 9, 8, 7, 6, 6, 7, 7, 7, 7, 9, 9

Bowerman - Chapter 02

64. What is the mean?

A. 8.0

B. 7.0

C. 6.0

D. 9.0

E. 7.4

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #64

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

65. What is the median?

A. 8.0

B. 7.0

C. 6.0

D. 9.0

E. 7.4

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #65

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

66. What is the mode?

A. 8.0

B. 7.0

C. 6.0

D. 9.0

E. 7.4

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #66

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

The values given below are snow depths measured as part of a study of satellite observations and water resources.

19, 18, 12, 25, 22, 8, 8, 16

Bowerman - Chapter 02

67. What is the mean?

A. 8

B. 23.5

C. 16

D. 17

E. 18

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #67

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

68. What is the median?

A. 8

B. 23.5

C. 16

D. 17

E. 18

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #68

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

69. What is the mode?

A. 8

B. 23.5

C. 16

D. 17

E. 18

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #69

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

In a hearing test, subjects estimate the loudness (in decibels) of sound, and the results are:

68, 67, 70, 71, 68, 75, 68, 62, 80, 73, 68

Bowerman - Chapter 02

70. What is the mean?

A. 70

B. 75

C. 68

D. 71

E. 80

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #70

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

71. What is the median?

A. 70

B. 75

C. 68

D. 71

E. 80

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #71

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

72. What is the mode?

A. 70

B. 75

C. 68

D. 71

E. 80

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #72

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

The reaction time in seconds to a stop light of a group of adult men were found to be 0.74, 0.71, 0.41, 0.82, 0.74, 0.85, 0.99, 0.71, 0.57, 0.85, 0.57, 0.55

Bowerman - Chapter 02

73. What is the mean?

A. 0.709

B. 0.710

C. 0.920

D. 0.725

E. 0.550

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #73

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

74. What is the median?

A. 0.709

B. 0.710

C. 0.920

D. 0.725

E. 0.550

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #74

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

75. What is the mode?

A. 0.709

B. 0.710

C. 0.920

D. 0.725

E. 0.550

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #75

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

In a rating of the satisfaction with their instructor, 13 students gave the following scores from a scale of 1 to 5:

3, 2, 1, 1, 5, 5, 4, 3, 3, 2, 4, 3, 3

76. What is the mean?

A. 3

B. 5

C. 2

D. 4

E. 3.25

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #76

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

77. What is the median?

A. 3

B. 5

C. 2

D. 4

E. 3.25

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #77

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

78. What is the mode?

A. 3

B. 5

C. 2

D. 4

E. 3.25

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #78

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

The company financial officer was interested in the average cost of PCs that had been purchased in the past six months. A random sample of the price of 10 computers was taken with the following results:
$3,250, $1,127, $2,995, $3,250, $3,445, $3,449, $1,482, $6,120, $3,009, $4,000

Bowerman - Chapter 02

79. What is the mean?

A. 3447

B. 3213

C. 3250

D. 6120

E. 3445

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #79

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

80. What is the median?

A. 3447

B. 3213

C. 3250

D. 6120

E. 3445

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #80

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

81. What is the mode?

A. 3447

B. 3213

C. 3250

D. 6120

E. 3445

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #81

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

The local amusement park was interested in the average wait time at their most popular roller coaster at the peak park time (2 p.m.). They selected 13 patrons and had them get in line between 2 and 3 p.m. Each was given a stop watch to record the time they spent in line. The times recorded were as follows (in minutes):
118, 124, 108, 116, 99, 120, 148, 118, 119, 121, 45, 130, 118

Bowerman - Chapter 02

82. What is the mean?

A. 114.15

B. 118

C. 148

D. 45

E. 115.5

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #82
Difficulty: Easy
Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

83. What is the median?

A. 114.15

B. 118

C. 148

D. 45

E. 115.5

Bowerman - Chapter 02 #83
Difficulty: Easy
Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

84. What is the mode?

A. 114.15

B. 118

C. 148

D. 45

E. 115.5

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #84

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

Quality control is an important issue at ACME Company which manufacturers light bulbs. In order to conduct testing of the life hours of their light bulbs, they randomly sampled nine light bulbs and measured how many hours they lasted.
378, 361, 350, 375, 200, 391, 375, 368, 321

Bowerman - Chapter 02

85. What is the mean?

A. 375

B. 368

C. 389.9

D. 200

E. 346.6

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #85

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

86. What is the median?

A. 375

B. 368

C. 389.9

D. 200

E. 346.6

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #86

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

87. What is the mode?

A. 375

B. 368

C. 389.9

D. 200

E. 346.6

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #87

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

Twenty students were randomly selected from a business statistics course and were asked to report the number of times that they had eaten a meal at the university's cafeteria within the past month. Below are the values reported:

7, 8, 10, 11, 8, 6, 10, 9, 9, 8, 13, 12, 8, 11, 11, 14, 8, 7, 10, 12

Bowerman - Chapter 02

88. What is the mean?

A. 8

B. 9.6

C. 9.5

D. 10.5

E. 9

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #88

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

89. What is the median?

A. 8

B. 9.6

C. 9.5

D. 10.5

E. 9

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #89

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

90. What is the mode?

A. 8

B. 9.6

C. 9.5

D. 10.5

E. 9

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #90

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

91. Find the coefficient of variation for an IQ test with a mean of 100 and a standard deviation of 15.

A. 15.0

B. 6.7

C. 0.15

D. 1.5

E. 0.67

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #91

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

92. Find the *z*-score for an IQ test score of 142 when the mean is 100 and the standard deviation is 15.

A. 42

B. 2.8

C. 18.78

D. 1.27

E. -2.8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #92

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

93. Find the *z*-score for an IQ test score of 92.2 when the mean is 100 and the standard deviation is 15.

A. 0.53

B. 0.77

C. -0.77

D. -0.52

E. -8.00

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #93

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

94. Find the *z*-score for an IQ test score of 118 when the mean is 100 and the standard deviation is 15.

A. 1.2

B. 1.0

C. 18.0

D. -1.03

E. -1.2

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #94

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

95. Find the *z*-score for an IQ test score of 125 when the mean is 100 and the standard deviation is 15.

A. 25

B. 1.1

C. 1.67

D. -1.1

E. -1.67

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #95

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

96. Using Chebyshev's Rule, find the interval that contains at least 93.75% of all measurements when mean = 2.549 and s = 1.828.

A. [-2.935, 8.033]

B. [-1.107, 6.205]

C. [-26.699, 31.797]

D. [2.435, 2.663]

E. [-4.763, 9.861]

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #96

Difficulty: Hard

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

According to a survey of the top 10 employers in a major city, a worker spends an average of 413 minutes a day on the job. Suppose the standard deviation is 26.8 minutes and the time spent is approximately a normal distribution.

Bowerman - Chapter 02

97. Within which interval will the times of approximately 68.26% of all workers fall?

A. [394.8, 431.2]

B. [386.2, 439.8]

C. [372.8, 453.2]

D. [359.4, 466.6]

E. [332.6, 493.4]

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #97

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

98. Within which interval will the times of approximately 95.44% of all workers fall?

A. [387.5, 438.5]

B. [386.2, 439.8]

C. [372.8, 453.2]

D. [359.4, 466.6]

E. [332.6, 493.4]

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #98

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

99. Within which interval will the times of approximately 99.73% of all workers fall?

A. [305.8, 520.2]

B. [386.2, 439.8]

C. [372.8, 453.2]

D. [359.4, 466.6]

E. [332.6, 493.4]

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #99

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

100. According to Chebyshev's Theorem, at least what percentage of measurements in a data set will be within two standard deviations of the mean?

A. 68%

B. 50%

C. 25%

D. 75%

E. 34%

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #100

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

101. According to Chebyshev's Theorem, at least what percentage of measurements in a data set will be within 2.5 standard deviations of the mean?

A. 16%

B. 40%

C. 68%

D. 60%

E. 84%

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #101

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

102. According to Chebyshev's Theorem, at least what percentage of measurements in a data set will be within 1.6 standard deviations of the mean?

A. 39%

B. 58%

C. 68%

D. 61%

E. 92%

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #102

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

103. According to Chebyshev's Theorem, at least what percentage of measurements in a data set will be within 3.2 standard deviations of the mean?

A. 90%

B. 95%

C. 84%

D. 97%

E. 10%

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #103

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

104. Consider the interval $\mu \pm k\sigma$ for some population. According to Chebyshev's theorem, what value of *k* would guarantee this interval would include at least 80% of the measurements in the population?

A. 5.0

B. 2.2

C. 2.5

D. 1.6

E. 2.0

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #104

Difficulty: Hard

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

In a statistic class, 10 scores were randomly selected with the following results were obtained (mean = 71.5):

74, 73, 77, 77, 71, 68, 65, 77, 67, 66

Bowerman - Chapter 02

105. What is the range?

A. 22.72

B. 12.00

C. 4.77

D. 516.20

E. 144.00

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #105

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

106. What is the variance?

A. 22.72

B. 12.00

C. 4.77

D. 516.20

E. 144.00

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #106

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

107. What is the standard deviation?

A. 22.72

B. 12.00

C. 4.77

D. 516.20

E. 144.00

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #107

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

The numbers of rooms for 15 homes recently sold were (mean = 7.4):

8, 8, 8, 5, 9, 8, 7, 6, 6, 7, 7, 7, 7, 9, 9

108. What is the range?

A. 1.183

B. 1.400

C. 4.00

D. 16.00

E. 1.96

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #108

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

109. What is the variance?

A. 1.183

B. 1.400

C. 4.00

D. 16.00

E. 1.96

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #109

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

110. What is the standard deviation?

A. 1.183

B. 1.400

C. 4.00

D. 16.00

E. 1.96

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #110

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

The values given below are snow depths measured as part of a study of satellite observations and water resources (mean = 16).

19, 18, 12, 25, 22, 8, 8, 16

Bowerman - Chapter 02

111. What is the range?

A. 39.14

B. 6.26

C. 17

D. 289

E. 18

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #111

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

112. What is the variance?

A. 39.14

B. 6.26

C. 17

D. 289

E. 18

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #112

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

113. What is the standard deviation?

A. 39.14

B. 6.26

C. 17

D. 289

E. 18

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #113

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

In a hearing test, subjects estimate the loudness (in decibels) of sound, and the results are (mean = 70):

68, 67, 70, 71, 68, 75, 68, 62, 80, 73, 68

114. What is the range?

A. 18

B. 4.73

C. 22.40

D. 324

E. 6.76

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #114

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

115. What is the variance?

A. 18

B. 4.73

C. 22.40

D. 324

E. 6.76

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #115

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

116. What is the standard deviation?

A. 18

B. 4.73

C. 22.40

D. 324

E. 6.76

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #116

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

The reaction time in seconds to a stop light for a group of adult men were found to be 0.74, 0.71, 0.41, 0.82, 0.74, 0.85, 0.99, 0.71, 0.57, 0.85, 0.57, 0.55 (mean = .709)

Bowerman - Chapter 02

117. What is the range?

A. 0.026

B. 0.052

C. 0.580

D. 0.1613

E. 0.0007

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #117

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

118. What is the variance?

A. 0.026

B. 0.052

C. 0.580

D. 0.1613

E. 0.0007

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #118

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

119. What is the standard deviation?

A. 0.026

B. 0.052

C. 0.580

D. 0.1613

E. 0.0007

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #119

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

In a rating of the satisfaction with their instructor, 13 students gave the following scores from a scale of 1 to 5 (mean = 3):

3, 2, 1, 1, 5, 5, 4, 3, 3, 2, 4, 3, 3

120. What is the range?

A. 3

B. 4

C. 1.291

D. 1.667

E. 2.779

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #120

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

121. What is the variance?

A. 3

B. 4

C. 1.291

D. 1.667

E. 2.779

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #121

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

122. What is the standard deviation?

A. 3

B. 4

C. 1.291

D. 1.667

E. 2.779

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #122

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

The company financial officer was interested in the average cost of PCs that had been purchased in the past six months. A random sample of the price of 10 computers was taken with the following results (mean = $3,213):
$3,250, $1,127, $2,995, $3,250, $3,445, $3,449, $1,482, $6,120, $3,009, $4,000

Bowerman - Chapter 02

123. What is the range?

A. 1359

B. 4993

C. 1846575

D. 3587

E. 1976454

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #123

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

124. What is the variance?

A. 1359

B. 4993

C. 1846575

D. 3587

E. 1976454

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #124

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

125. What is the standard deviation?

A. 1359

B. 4993

C. 1846575

D. 3587

E. 1976454

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #125

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

The local amusement park was interested in the average wait time at their most popular roller coaster at the peak park time (2 p.m.). They selected 13 patrons and had them get in line between 2 and 3 p.m. Each was given a stop watch to record the time they spent in line. The times recorded were as follows (in minutes) (mean = 114.15):
118, 124, 108, 116, 99, 120, 148, 118, 119, 121, 45, 130, 118

Bowerman - Chapter 02

126. What is the range?

A. 103
B. 23.62
C. 557.97
D. 128.8
E. 115

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #126
Difficulty: Easy
Learning Objective: 02-07 Compute the variance and standard deviation from raw data

127. What is the variance?

A. 103
B. 23.62
C. 557.97
D. 128.8
E. 115

Accessibility: Keyboard Navigation
Bowerman - Chapter 02 #127
Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

128. What is the standard deviation?

A. 103

B. 23.62

C. 557.97

D. 128.8

E. 115

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #128

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

Quality control is an important issue at ACME Company which manufacturers light bulbs. In order to conduct testing of the life hours of their light bulbs, they randomly sampled nine light bulbs and measured how many hours they lasted (mean = 346.6).
378, 361, 350, 375, 200, 391, 375, 368, 321

Bowerman - Chapter 02

129. What is the range?

A. 342.43

B. 3424.3

C. 58.5

D. 191

E. 10609

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #129

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

130. What is the variance?

A. 342.43

B. 3424.3

C. 58.5

D. 191

E. 10609

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #130

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

131. What is the standard deviation?

A. 342.43

B. 3424.3

C. 58.5

D. 191

E. 10609

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #131

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

Twenty students were randomly selected from the most recent graduating class at a Canadian university. The number of semesters they were enrolled was calculated (mean = 9.6)

7, 8, 10, 11, 8, 6, 10, 9, 9, 8, 13, 12, 8, 11, 11, 14, 8, 7, 10, 12

Bowerman - Chapter 02

132. What is the range?

A. 8

B. 2.162

C. 9.5

D. 4.674

E. 21.846

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #132

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

133. What is the variance?

A. 8

B. 2.162

C. 9.5

D. 4.674

E. 21.846

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #133

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

134. What is the standard deviation?

A. 8

B. 2.162

C. 9.5

D. 4.674

E. 21.846

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #134

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

In a statistic class, 10 scores were randomly selected with the following results were obtained:

74, 73, 77, 77, 71, 68, 65, 77, 67, 66

Bowerman - Chapter 02

135. What is the 90^{th} percentile?

A. 77

B. 73

C. 74

D. 67

E. 65.9

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #135

Difficulty: Medium

Learning Objective: N/A

136. What is the third quartile?

A. 65.9

B. 67.3

C. 66.75

D. 73.85

E. 77.0

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #136

Difficulty: Medium

Learning Objective: N/A

137. What is the first quartile?

A. 65.9

B. 67.3

C. 67.0

D. 73.85

E. 77.0

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #137

Difficulty: Medium

Learning Objective: N/A

138. What is the 10th percentile?

A. 65.5

B. 67.3

C. 66.75

D. 73.85

E. 77.0

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #138

Difficulty: Medium

Learning Objective: N/A

139. What is the 65th percentile?

A. 65.9

B. 67.3

C. 66.75

D. 74.0

E. 77.0

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #139

Difficulty: Medium

Learning Objective: N/A

140. What is the *IQR*?

A. 12.00

B. 5.25

C. 10.00

D. 5.00

E. 11.00

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #140

Difficulty: Easy

Learning Objective: N/A

141. What are the inner fences?

A. 15.375, 30.75

B. 82.125, 92.375

C. 97.50, 107.75

D. 52.00, 92.00

E. 35.95, 107.75

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #141

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

142. What are the outer fences?

A. 15.375, 30.75

B. 51.375, 92.375

C. 37.00, 107.00

D. 82.125, 92.375

E. 97.50, 107.75

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #142

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

The numbers of rooms for 15 home recently sold were;

8, 8, 8, 5, 9, 8, 7, 6, 6, 7, 7, 7, 7, 9, 9

Bowerman - Chapter 02

143. What is the 90th percentile?

A. 9

B. 8

C. 7

D. 6

E. 5

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #143

Difficulty: Medium

Learning Objective: N/A

144. What is the third quartile?

A. 9

B. 8

C. 7

D. 6

E. 5

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #144

Difficulty: Medium

Learning Objective: N/A

145. What is the first quartile?

A. 9

B. 8

C. 7

D. 6

E. 5

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #145

Difficulty: Medium

Learning Objective: N/A

146. What is the 10th percentile?

A. 9

B. 8

C. 7

D. 6

E. 5

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #146

Difficulty: Medium

Learning Objective: N/A

147. What is the 65th percentile?

A. 9

B. 8

C. 7

D. 6

E. 5

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #147

Difficulty: Medium

Learning Objective: N/A

148. What is the *IQR*?

A. 15

B. 1.5

C. 3

D. 4

E. 1

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #148

Difficulty: Easy

Learning Objective: N/A

149. What are the inner fences?

A. 4, 11

B. 8.5, 9.5

C. 5.5, 9.5

D. 10, 9.5

E. 5.5, 10

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #149

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

150. What are the outer fences?

A. 5.5, 9.5

B. 4, 11

C. 8.5, 9.5

D. 10, 9.5

E. 5.5, 10

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #150

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

The values given below are snow depths measured as part of a study of satellite observations and water resources.

19, 18, 12, 25, 22, 8, 8, 16

Bowerman - Chapter 02

151. What is the 90^{th} percentile?

A. 8

B. 25

C. 18.55

D. 9

E. 21.25

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #151

Difficulty: Medium

Learning Objective: N/A

152. What is the third quartile?

A. 8

B. 22.9

C. 18.55

D. 9

E. 20.5

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #152

Difficulty: Medium

Learning Objective: N/A

153. What is the first quartile?

A. 8

B. 22.9

C. 18.55

D. 10

E. 21.25

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #153

Difficulty: Medium

Learning Objective: N/A

154. What is the 10th percentile?

A. 8

B. 22.9

C. 18.55

D. 9

E. 21.25

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #154

Difficulty: Medium

Learning Objective: N/A

155. What is the 65th percentile?

A. 8

B. 22.9

C. 19

D. 9

E. 21.25

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #155

Difficulty: Medium

Learning Objective: N/A

156. What is the *IQR*?

A. 10.5

B. 18.375

C. 36.75

D. 21.25

E. 30.25

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #156

Difficulty: Easy

Learning Objective: N/A

157. What are the inner fences?

A. 27.375, 39.625

B. -5.75, 36.25

C. -27.75, 58.00

D. 45.75, 58.00

E. 18.375, 36.75

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #157

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

158. What are the outer fences?

A. -9.375, 39.625

B. -21.5, 52.00

C. 27.375, 39.625

D. 45.75, 58.00

E. 18.375, 36.75

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #158

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

In a hearing test, subjects estimate the loudness (in decibels) of sound, and the results are; 68, 67, 70, 71, 68, 75, 68, 62, 80, 73, 68

Bowerman - Chapter 02

159. What is the 90^{th} percentile?

A. 73

B. 68

C. 70.5

D. 67

E. 75

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #159

Difficulty: Medium

Learning Objective: N/A

160. What is the third quartile?

A. 73

B. 68

C. 70.5

D. 67

E. 75

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #160

Difficulty: Medium

Learning Objective: N/A

161. What is the first quartile?

A. 73

B. 68

C. 70.5

D. 67

E. 75

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #161

Difficulty: Medium

Learning Objective: N/A

162. What is the 10th percentile?

A. 73

B. 68

C. 70.5

D. 67

E. 75

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #162

Difficulty: Medium

Learning Objective: N/A

163. What is the 65th percentile?

A. 73

B. 68

C. 71

D. 67

E. 75

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #163

Difficulty: Medium

Learning Objective: N/A

164. What is the *IQR*?

A. 18

B. 6

C. 5

D. 7.5

E. 15

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #164

Difficulty: Easy

Learning Objective: N/A

165. What are the inner fences?

A. 75.5, 80.5

B. 83, 88

C. 60.5, 80.5

D. 53, 88

E. 7.5, 15

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #165

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

166. What are the outer fences?

A. 60.5, 80.5

B. 75.5, 80.5

C. 53, 88

D. 83, 88

E. 7.5, 15

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #166

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

The reaction time (in seconds) to a stop at a red light for a group of adult men was found to be 0.74, 0.71, 0.41, 0.82, 0.74, 0.85, 0.99, 0.71, 0.57, 0.85, 0.57, 0.55

Bowerman - Chapter 02

167. What is the 90^{th} percentile?

A. 0.752

B. 0.552

C. 0.85

D. 0.8425

E. 0.57

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #167

Difficulty: Medium

Learning Objective: N/A

168. What is the third quartile?

A. 0.752

B. 0.552

C. 0.85

D. 0.835

E. 0.57

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #168

Difficulty: Medium

Learning Objective: N/A

169. What is the first quartile?

A. 0.752

B. 0.552

C. 0.85

D. 0.8425

E. 0.57

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #169

Difficulty: Medium

Learning Objective: N/A

170. What is the 10th percentile?

A. 0.752

B. 0.55

C. 0.85

D. 0.8425

E. 0.57

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #170

Difficulty: Medium

Learning Objective: N/A

171. What is the 65th percentile?

A. 0.74

B. 0.552

C. 0.85

D. 0.8425

E. 0.57

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #171

Difficulty: Medium

Learning Objective: N/A

172. What is the *IQR*?

A. 265

B. 8175

C. 40875

D. 57

E. 8425

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #172

Difficulty: Easy

Learning Objective: N/A

173. What are the inner fences?

A. 97875, 1.25125

B. 3875, 1.66

C. -.2475, 1.66

D. 40875, .8175

E. 1725, 1.2325

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #173

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

174. What are the outer fences?

A. -.225, 1.63

B. 16125, 1.25125

C. 97875, 1.25125

D. 1.3875, 1.66

E. 40875, .8175

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #174

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

In a rating of the satisfaction with their instructor, 13 students gave the following scores from a scale of 1 to 5;

3, 2, 1, 1, 5, 5, 4, 3, 3, 2, 4, 3, 3

Bowerman - Chapter 02

175. What is the 90^{th} percentile?

A. 1.2

B. 2

C. 3

D. 4

E. 5

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #175

Difficulty: Medium

Learning Objective: N/A

176. What is the third quartile?

A. 1.2

B. 2

C. 3

D. 4

E. 4.8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #176

Difficulty: Medium

Learning Objective: N/A

177. What is the first quartile?

A. 1.2

B. 2

C. 3

D. 4

E. 4.8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #177

Difficulty: Medium

Learning Objective: N/A

178. What is the 10th percentile?

A. 1

B. 2

C. 3

D. 4

E. 4.8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #178

Difficulty: Medium

Learning Objective: N/A

179. What is the 65th percentile?

A. 1.2

B. 2

C. 3

D. 4

E. 4.8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #179

Difficulty: Medium

Learning Objective: N/A

180. What is the *IQR*?

A. 2

B. 6

C. 3

D. 4

E. 1

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #180

Difficulty: Easy

Learning Objective: N/A

181. What are the inner fences?

A. -1, 7

B. -4, 10

C. 5, 7

D. 8, 10

E. 3, 6

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #181

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

182. What are the outer fences?

A. -1, 7

B. -4, 10

C. 5, 7

D. 8, 10

E. 3, 6

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #182

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

The company financial officer was interested in the average cost of PCs that had been purchased in the past six months. A random sample of the price of 10 computers was taken with the following results;
$3,250, $1,127, $2,995, $3,250, $3,445, $3,449, $1,482, $6,120, $3,009, $4,000

Bowerman - Chapter 02

183. What is the 90th percentile?

A. $1,446.5

B. $2,617

C. $3,415.75

D. $3,587

E. $5,060

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #183

Difficulty: Medium

Learning Objective: N/A

184. What is the third quartile?

A. $1,446.5

B. $2,617

C. $3,415.75

D. $3,449

E. $4,212

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #184

Difficulty: Medium

Learning Objective: N/A

185. What is the first quartile?

A. $1,446.5

B. $2,995

C. $3,415.75

D. $3,587

E. $4,212

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #185

Difficulty: Medium

Learning Objective: N/A

186. What is the 10th percentile?

A. $1,304.50

B. $2,617

C. $3,415.75

D. $3,587

E. $4,212

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #186

Difficulty: Medium

Learning Objective: N/A

187. What is the 65th percentile?

A. $1,446.5

B. $2,617

C. $3,445

D. $3,587

E. $4,212

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #187

Difficulty: Medium

Learning Objective: N/A

188. What is the *IQR*?

A. 1455

B. 454

C. 2910

D. 4993

E. 6204

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #188

Difficulty: Easy

Learning Objective: N/A

189. What are the inner fences?

A. 1455, 2910

B. 4072, 5042

C. 5527, 6497

D. 2314, 4130

E. -293, 6497

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #189

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

190. What are the outer fences?

A. 1455, 2910

B. 4072, 5042

C. 5527, 6497

D. 1162, 5042

E. 1633, 4811

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #190

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

The local amusement park was interested in the average wait time at their most popular roller coaster at the peak park time (2 p.m.). They selected 13 patrons and had them get in line between 2 and 3 p.m. Each was given a stop watch to record the time they spent in line. The times recorded were as follows (in minutes)
118, 124, 108, 116, 99, 120, 148, 118, 119, 121, 45, 130, 118

Bowerman - Chapter 02

191. What is the 90^{th} percentile?

A. 100.8

B. 119.8

C. 130

D. 112

E. 122.5

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #191

Difficulty: Medium

Learning Objective: N/A

192. What is the third quartile?

A. 100.8

B. 119.8

C. 128.8

D. 112

E. 121

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #192

Difficulty: Medium

Learning Objective: N/A

193. What is the first quartile?

A. 100.8

B. 119.8

C. 128.8

D. 116

E. 122.5

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #193

Difficulty: Medium

Learning Objective: N/A

194. What is the 10th percentile?

A. 99

B. 119.8

C. 128.8

D. 112

E. 122.5

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #194

Difficulty: Medium

Learning Objective: N/A

195. What is the 65th percentile?

A. 100.8

B. 120

C. 128.8

D. 112

E. 122.5

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #195

Difficulty: Medium

Learning Objective: N/A

196. What is the *IQR*?

A. 21.00

B. 5

C. 15.75

D. 31.50

E. 11.50

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #196

Difficulty: Easy

Learning Objective: N/A

197. What are the inner fences?

A. 108.50, 128.50

B. 80.50, 154.00

C. 127.75, 138.25

D. 143.50, 154.00

E. 15.75, 31.50

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #197

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

198. What are the outer fences?

A. 96.25, 138.25

B. 101.00, 136.00

C. 127.75, 138.25

D. 143.50, 154.00

E. 15.75, 31.50

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #198

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

Quality control is an important issue at ACME Company which manufacturers light bulbs. In order to conduct testing of the life hours of their light bulbs, they randomly sampled nine light bulbs and measured how many hours they lasted.
378, 361, 350, 375, 200, 391, 375, 368, 321

Bowerman - Chapter 02

199. What is the 90^{th} percentile?

A. 335.5

B. 370.5

C. 391

D. 296.8

E. 375

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #199

Difficulty: Medium

Learning Objective: N/A

200. What is the third quartile?

A. 335.5

B. 370.5

C. 380.6

D. 296.8

E. 375

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #200

Difficulty: Medium

Learning Objective: N/A

201. What is the first quartile?

A. 350

B. 370.5

C. 380.6

D. 296.8

E. 375

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #201

Difficulty: Medium

Learning Objective: N/A

202. What is the 10th percentile?

A. 335.5

B. 370.5

C. 380.6

D. 200

E. 375

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #202

Difficulty: Medium

Learning Objective: N/A

203. What is the 65th percentile?

A. 335.5

B. 370.5

C. 380.6

D. 296.8

E. 375

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #203

Difficulty: Medium

Learning Objective: N/A

204. What is the *IQR*?

A. 25

B. 22

C. 61.50

D. 191

E. 82

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #204

Difficulty: Easy

Learning Objective: N/A

205. What are the inner fences?

A. 312.5, 412.5

B. 212.5, 499.5

C. 397.0, 438.0

D. 458.5, 499.5

E. 61.5, 123.0

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #205

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

206. What are the outer fences?

A. 274.0, 438.0

B. 275.0, 450.0

C. 397.0, 438.0

D. 458.5, 499.5

E. 61.5, 123.0

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #206

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

Twenty students were randomly selected from a business statistics course and were asked to report the number of times that they had eaten a meal at the university's cafeteria within the past month. Below are the values reported:
7, 8, 10, 11, 8, 6, 10, 9, 9, 8, 13, 12, 8, 11, 11, 14, 8, 7, 10, 12

Bowerman - Chapter 02

207. What is the 90^{th} percentile?

A. 7

B. 10.35

C. 12.5

D. 11

E. 8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #207

Difficulty: Medium

Learning Objective: N/A

208. What is the third quartile?

A. 7

B. 10.35

C. 12.1

D. 11

E. 8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #208

Difficulty: Medium

Learning Objective: N/A

209. What is the first quartile?

A. 7

B. 10.35

C. 12.1

D. 11

E. 8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #209

Difficulty: Medium

Learning Objective: N/A

210. What is the 10th percentile?

A. 7

B. 10.35

C. 12.1

D. 11

E. 8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #210

Difficulty: Medium

Learning Objective: N/A

211. What is the 65th percentile?

A. 7

B. 10.5

C. 12.1

D. 11

E. 8

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #211

Difficulty: Medium

Learning Objective: N/A

212. What is the *IQR*?

A. 3

B. 8

C. 3.5

D. 11

E. 4.5

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #212

Difficulty: Easy

Learning Objective: N/A

213. What are the inner fences?

A. 17, 20

B. 3.5, 15.5

C. 12.5, 15.5

D. -1, 20

E. 4.5, 9.0

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #213

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

214. What are the outer fences?

A. 17, 20

B. -1, 20

C. 3.5, 15.5

D. 12.5, 15.5

E. 4.5, 9.0

Accessibility: Keyboard Navigation

Bowerman - Chapter 02 #214

Difficulty: Hard

Learning Objective: 02-05 Define the term outlier

In a survey of 550 randomly-selected business statistic students were surveyed on their impressions of their course, instructor, and textbook. The results are as follows:

Rate the overall quality of your course.		
	Excellent	154
	Good	187
	Fair	71
	Poor	138
How effective was your instructor?		
	Very effective	75
	Somewhat effective	220
	Somewhat ineffective	155
	Very ineffective	100
How easy was it to read and understand the textbook?		
	Very easy	21
	Easy	83
	Hard	361
	Very hard	85

Use the above results to answer the following questions:

Compute a point estimate of the proportion of all college statistic students who:

215. Think their instructor was "very effective"

A. 0.136

B. 0.536

C. 0.182

D. 0.280

E. 0.014

Bowerman - Chapter 02 #215

Difficulty: Easy

Learning Objective: N/A

216. Feel their textbook is not "easy" or "very easy"

A. 0.189

B. 0.811

C. 0.009

D. 0.656

E. 0.151

Bowerman - Chapter 02 #216

Difficulty: Medium

Learning Objective: N/A

217. Think the quality of the course was "fair"

A. 0.251

B. 0.620

C. 0.129

D. 0.871

E. 0.340

Bowerman - Chapter 02 #217

Difficulty: Easy

Learning Objective: N/A

218. Think that they had a "very ineffective" or "somewhat ineffective" instructor

A. 0.282

B. 0.136

C. 0.182

D. 0.280

E. 0.464

Bowerman - Chapter 02 #218

Difficulty: Medium

Learning Objective: N/A

219. Of the students who thought their textbook was very hard to read, 50 also thought that the quality of the course was "poor". What proportion of students who think that their textbook was "hard" also thought their course was "poor".

A. 0.588

B. 0.155

C. 0.091

D. 0.251

E. 0.616

Bowerman - Chapter 02 #219

Difficulty: Hard

Learning Objective: N/A

The 550 students answered an additional question with the following results based on their rating of their instructor:

	Very or Somewhat Effective	Very or Somewhat Ineffective
Final Grade		
A	190	85
B	75	120
C	20	17
D	9	18
F	1	15

Bowerman - Chapter 02

220. What proportion of the students who rated their instructor as very or somewhat effective received a B or better in the class?

A. 0.345

B. 0.254

C. 0.482

D. 0.898

E. 0.644

Bowerman - Chapter 02 #220

Difficulty: Hard

Learning Objective: N/A

221. What proportion of all 550 students received less than a C?

A. 0.03

B. 0.06

C. 0.08

D. 0.13

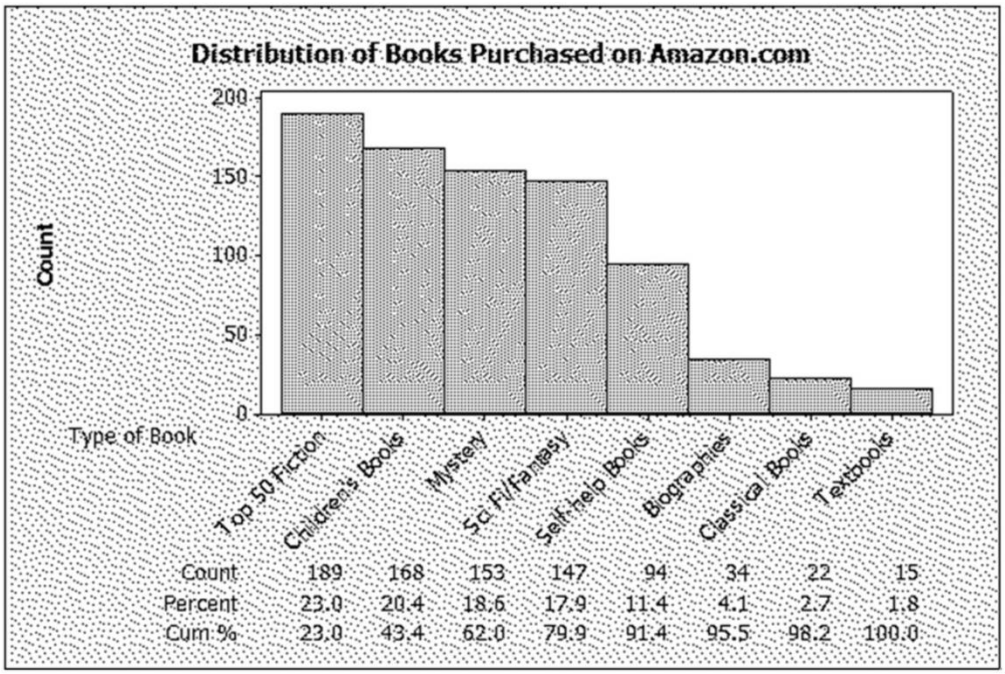
E. 0.15

Bowerman - Chapter 02 #221

Difficulty: Hard

Learning Objective: N/A

822 customers were randomly selected from those who had recently bought a book over the internet. The chart below shows the breakdown of the classification of the book type:



Bowerman - Chapter 02

222. What percentage of the books purchased were either mystery or science fiction/fantasy?

A. 18.61

B. 36.50

C. 17.88

D. 24.33

E. 22.99

Bowerman - Chapter 02 #222

Difficulty: Easy

Learning Objective: N/A

223. What proportion of the books purchased were self-help books?

A. 0.1144

B. 11.44

C. 1.82

D. 0.0182

E. 0.940

Bowerman - Chapter 02 #223

Difficulty: Easy

Learning Objective: N/A

224. What percentage of books were in the top two categories?

A. 22.99

B. 20.44

C. 4.50

D. 43.43

E. 4343

Bowerman - Chapter 02 #224

Difficulty: Medium

Learning Objective: N/A

225. A graphical display of categorical data made up of vertical or horizontal bars is called a _____.

Bar Chart

Bowerman - Chapter 02 #225

Difficulty: Medium

Learning Objective: N/A

226. A measurement located between the inner and outer fences of a box-and-whisker display is a(n) _____.

mild outlier

Bowerman - Chapter 02 #226
Difficulty: Medium
Learning Objective: 02-05 Define the term outlier

227. A measurement located outside the outer fences of a box-and-whisker display is a(n) _____.

extreme outlier

Bowerman - Chapter 02 #227
Difficulty: Medium
Learning Objective: 02-05 Define the term outlier

228. A graphical portrayal of a data set that divides the data into classes and gives the frequency of each class is a(n) _____.

Histogram

Bowerman - Chapter 02 #228
Difficulty: Medium
Learning Objective: 02-02 Describe how a histogram is constructed

229. Another name for the 50^{th} percentile is the _____.

Median

Bowerman - Chapter 02 #229
Difficulty: Medium
Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

230. The measurement in a sample or a population that occurs most frequently is the _____.

Mode

Bowerman - Chapter 02 #230
Difficulty: Medium
Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

231. The average of the squared deviations of the individual population measurement from the population mean is the _____.

Variance

Bowerman - Chapter 02 #231
Difficulty: Medium
Learning Objective: 02-07 Compute the variance and standard deviation from raw data

232. If a process is able to consistently produce output that meets customer requirements (specifications), we say that it is a _____ process.

capable

Bowerman - Chapter 02 #232
Difficulty: Medium
Learning Objective: N/A

233. Histograms and stem-and-leaf displays are used to visualize the distribution of _____ data.

quantitative

Bowerman - Chapter 02 #233
Difficulty: Medium
Learning Objective: 02-01 Explain what is demonstrated by a stem-and-leaf display that you have constructed
Learning Objective: 02-03 Identify when a histogram should be used

234. The difference between the largest and smallest measurements in a population or sample is the _____.

Range

Bowerman - Chapter 02 #234

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

235. A relative frequency curve having a long tail to the right is said to be _____ to the right.

Skewed

Bowerman - Chapter 02 #235

Difficulty: Medium

Learning Objective: 02-04 Differentiate between a symmetrical distribution and a positively or negatively skewed distribution

236. If the mean is greater than the median, then the distribution is skewed _____.

Right or positively

Bowerman - Chapter 02 #236

Difficulty: Medium

Learning Objective: 02-04 Differentiate between a symmetrical distribution and a positively or negatively skewed distribution

237. The proportion of measurements in a class is called the _____ of that class.

Relative frequency

Bowerman - Chapter 02 #237

Difficulty: Medium

Learning Objective: 02-02 Describe how a histogram is constructed

238. A histogram that tails out towards larger values is skewed _____.

positively or to the right

Bowerman - Chapter 02 #238

Difficulty: Medium

Learning Objective: 02-04 Differentiate between a symmetrical distribution and a positively or negatively skewed distribution

239. A histogram that tails out towards smaller values is skewed _____.

negatively or to the left

Bowerman - Chapter 02 #239

Difficulty: Medium

Learning Objective: 02-04 Differentiate between a symmetrical distribution and a positively or negatively skewed distribution

240. The point estimate of the population _____ is the positive square root of the sample variance.

Standard deviation

Bowerman - Chapter 02 #240

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

241. The _____ is a quantity that measures the variation of a population or sample relative to its mean.

coefficient of variation

Bowerman - Chapter 02 #241

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

242. A(n) _____ is a graphical display of categorical data made up of vertical or horizontal bars.

Bar chart

Bowerman - Chapter 02 #242
Difficulty: Easy
Learning Objective: N/A

243. What percent of a normal population is within 2 standard deviations of the mean?

95.44

Bowerman - Chapter 02 #243
Difficulty: Medium
Learning Objective: 02-07 Compute the variance and standard deviation from raw data

244. Twenty students were randomly selected from a business statistics course and were asked to report the number of times that they had eaten a meal at the university's cafeteria within the past month. Below are the values reported: 7, 8, 10, 11, 8, 6, 10, 9, 9, 8, 13, 12, 8, 11, 11, 14, 8, 7, 10, 12. What is the 90^{th} percentile?

12.5

Bowerman - Chapter 02 #244
Difficulty: Medium
Learning Objective: N/A

245. Compute the mean of the data 32,33,22,28,24,23,27,24,27,21.

26.1

Bowerman - Chapter 02 #245

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

246. Compute the median of the data 32,33,22,28,24,23,27,24,27,21.

25.5

Bowerman - Chapter 02 #246

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

247. Compute the mode(s) of the data 32,33,22,28,24,23,27,24,27,21.

24 and 27

Bowerman - Chapter 02 #247

Difficulty: Medium

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

248. Compute the range of the data: 16,18,23,21,17,16,24,23,9,17,11,16,13,10,15,14.

15

Range = 24 - 9 = 15

Bowerman - Chapter 02 #248

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

249. Compute the population variance of the data:

16,18,23,21,17,16,24,23,9,17,11,16,22,10,15,14.

20.5

$$\sigma^2 = \frac{\sum_{i=1}^{N}(X_i - \mu)^2}{N} = \frac{(16-17)^2 + (18-17)^2 + \ldots + (14-17)^2}{16} = \frac{328}{16} = 20.5$$

Bowerman - Chapter 02 #249

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

250. Determine the sample mean of the data 5,4,8,6,1,0,2,6.

4

Bowerman - Chapter 02 #250

Difficulty: Medium

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

251. Determine the median of the data 2,4,6,8,10,12,14.

8

Bowerman - Chapter 02 #251

Difficulty: Medium

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

252. Determine the mode of the data 2,4,6,2,5,6,2,9,4,5,2,1.

2

Bowerman - Chapter 02 #252

Difficulty: Medium

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

253. Compute the sample standard deviation of the data 5,4,8,6,1,0,2,6.

2.77

Bowerman - Chapter 02 #253

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

254. What is the range of the following set of data: 3,7,2,1,8?

7

Bowerman - Chapter 02 #254

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

255. Calculate a one standard deviation tolerance interval for the data that has a sample mean of 28,475 and a standard deviation of 9,369.

19,106 to 37,844

28,475 - 9,369 = 19,106

28,475 + 9,369 = 37,844

Bowerman - Chapter 02 #255

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

256. Calculate a two standard deviation tolerance interval for the data that has a sample mean of 28,475 and a standard deviation of 9,369.

9,737 to 47,213

28,475 - 2(9,369) = 9,737

28,475 + 2(9,369) = 47,213

Bowerman - Chapter 02 #256

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

257. Calculate a three standard deviation tolerance interval for the data that has a sample mean of 28,475 and a standard deviation of 9,369.

368 to 56,582

28,475 - 3(9,369) = 368

28,475 + 3(9,369) = 56,582

Bowerman - Chapter 02 #257

Difficulty: Easy

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

258. If the median of a data set is 760 and the upper quartile is 950, and the lower quartile is 650, what is the interquartile range?

300 Interquartile range = 950 - 650 = 300

Bowerman - Chapter 02 #258

Difficulty: Medium

Learning Objective: N/A

259. If the median of the data set is 40 and the upper quartile is 42 and the lower quartile is 37, what is the interquartile range?

5 Interquartile range = 42 - 37 = 5

Bowerman - Chapter 02 #259

Difficulty: Medium

Learning Objective: N/A

260. Given a set of data with a mean of 150 and a standard deviation of 20. Using Chebyshev's Theorem, what is the minimum percentage of data between 110 and 190?

75%

$$k = \frac{150 - 110}{20} = 2$$

$$1 - \frac{1}{k^2} = 1 - \frac{1}{4} = .75$$

Bowerman - Chapter 02 #260

Difficulty: Hard

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

261. Given a set of data with mean of 150 and a standard deviation of 25. Using Chebyshev's Theorem, what is the minimum percentage of data between 75 and 225?

88.89%

$$k = \frac{150 - 75}{25} = 3$$

$$1 - \frac{1}{k^2} = 1 - \frac{1}{9} = .8889$$

Bowerman - Chapter 02 #261

Difficulty: Hard

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

262. Determine the median of the data set 95,86,78,90,62,73,89,92,84,76.

85

Bowerman - Chapter 02 #262

Difficulty: Medium

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

263. Compute the sample standard deviation of the data set 6,4,2,1,4,1

2

$$s = \sqrt{\frac{(5-3)^2 + (4-3)^2 + (2-3)^2 + (1-3)^2 + (4-3)^2 + (1-3)^2}{6-1}} = \sqrt{\frac{20}{5}} = 2$$

Bowerman - Chapter 02 #263

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

264. If 50 of 500 sampled customers said they would make a purchase of a new TV set, what is the sample proportion?

10

Bowerman - Chapter 02 #264

Difficulty: Easy

Learning Objective: N/A

265. Describe the shape of a population distribution, if the median is greater than the mean.

Skewed to the left, or negatively skewed.

Bowerman - Chapter 02 #265

Difficulty: Medium

Learning Objective: 02-04 Differentiate between a symmetrical distribution and a positively or negatively skewed distribution

266. In a normally distributed population, what tolerance interval contains 68.26 percent of all measurements?

$\mu \pm \sigma$

Bowerman - Chapter 02 #266

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

267. In a normally distributed population, what tolerance interval contains 95.44 percent of all measurements?

$\mu \pm 2\sigma$

Bowerman - Chapter 02 #267

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

268. In a normally distributed population, what tolerance interval contains 99.73 percent of all measurements?

$\mu \pm 3\sigma$

Bowerman - Chapter 02 #268

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

269. What are three important properties of any data set?

central tendency, variation, and shape

Bowerman - Chapter 02 #269
Difficulty: Hard
Learning Objective: 02-01 Explain what is demonstrated by a stem-and-leaf display that you have constructed
Learning Objective: 02-03 Identify when a histogram should be used

270. If specifications for a process are (1.6, 1.8), and a 99.73 percent tolerance interval is (1.62, 1.83), is the process capable?

No

Bowerman - Chapter 02 #270
Difficulty: Medium
Learning Objective: N/A

271. The average lateness for one of the top airline companies is 10 minutes. The variance of the lateness measure is calculated as 9. What is the coefficient of variation?

30

$$\frac{\sqrt{9}}{10}(100) = \frac{3}{10}(100) = 30$$

Bowerman - Chapter 02 #271
Difficulty: Medium
Learning Objective: N/A

272. The average lateness for one of the top airline companies is 10 minutes. The variance of the lateness measure is calculated as 9. An airplane arrived 13 minutes after the stated arrival time. Calculate the Z-score for this particular airplane's lateness.

1

$$Z = \frac{13-10}{\sqrt{9}} = 1$$

Bowerman - Chapter 02 #272

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

The average life of Canadian women is 73.75 years and the standard deviation of the women's life expectancy in Canada is 6.5 years.

Bowerman - Chapter 02

273. Using the Chebychev's theorem, determine the minimum percentage of women in Canada whose life expectancy is between 64 and 83.5 years.

55.56%

$$k = \frac{83.5-73.75}{6.5} = 1.5$$

$$1-\frac{1}{k^2} = 1-\frac{1}{(1.5)^2} = 0.5666$$

Bowerman - Chapter 02 #273

Difficulty: Hard

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

274. Based on Chebychev's inequality determine the upper and lower bounds on the average life expectancy of the Canadian women such that at least 90% of all population is included.

53.2 to 94.3

$$1-\frac{1}{k^2}=.90$$
$$\frac{1}{k^2}=0.1$$
$$k^2=\frac{1}{.1}=10; \qquad k=\sqrt{10}=3.162$$
$$lower\ \ bound=73.75-(3.162)(6.5)\cong 53.2$$
$$upper\ \ bound=73.75+(3.162)(6.5)=94.3$$

Bowerman - Chapter 02 #274

Difficulty: Hard

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

275. The average lateness for one of the top airline companies is 10 minutes. The variance of the lateness measure is calculated as 9. An airplane arrived 8.5 minutes after the stated arrival time. Calculate the Z-score for this particular airplane's lateness.

-0.5

$$Z=\frac{8.5-10}{\sqrt{9}}=-0.5$$

Bowerman - Chapter 02 #275

Difficulty: Medium

Learning Objective: 02-07 Compute the variance and standard deviation from raw data

The following table shows the Price-to-Earnings ratio for a Stereo equipment manufacturing company between 1998 and 2002.

Year	P/E Ratio
1998	12.4
1999	14.6
2000	11.1
2001	8.2
2002	6.8

Bowerman - Chapter 02

276. Determine the percentage change in the P/E ratios from 1998 to 1999.

17.74%

$$R_1 = \left(\frac{14.6 - 12.4}{12.4}\right) x\,100 = 17.74\%$$

Bowerman - Chapter 02 #276

Difficulty: Medium

Learning Objective: N/A

277. Determine the percentage change in the P/E ratios from 1999 to 2000.

-23.97%

$$R_2 = \left(\frac{11.1 - 14.6}{14.6}\right) x\,100 = -23.97\%$$

Bowerman - Chapter 02 #277

Difficulty: Medium

Learning Objective: N/A

278. The following table shows the annual percentage growth rate for a Stereo equipment manufacturing company between 1998 and 2002. The of the P/E ratios are also calculated and given below:

Year	Growth rate %
2007	17.74% (2006 – 2007)
2008	-23.97% (2007 – 2008)
2009	-26.13% (2008 – 2009)
2010	-17.07% (2009 – 2010)

Calculate the mean growth rate.

-12.36%

Bowerman - Chapter 02 #278

Difficulty: Easy

Learning Objective: N/A

The following frequency table summarizes the ages of 64 shoppers at the local grocery store.

Age of the shopper	Frequency
15 – 23	10
24 – 32	21
33 – 41	10
42 – 50	8
51 – 59	5
60 – 68	6

Bowerman - Chapter 02

279. Calculate the (approximate) sample mean for this data (mean for the grouped data).

36.25 years

Age of the shopper	Frequency	Class Midpoint	f_iM_i
15 – 23	10	19	190
24 – 32	21	28	588
33 – 41	10	37	370
42 – 50	8	46	368
51 – 59	5	55	275
60 – 68	6	64	384
			2175

$$\overline{x} = \frac{\sum f_i M_i}{\sum f_i} = \frac{2175}{60} = 36.25$$

Bowerman - Chapter 02 #279

Difficulty: Medium

Learning Objective: N/A

280. The sample mean for the above frequency table is calculated as 36.25. Calculate the (approximate) sample variance and standard deviation for this data set.

184.1493 and 13.57

Class Midpoint (M_i)	$M_i - \bar{X}$	$(M_i - \bar{X})^2$	$f_i(M_i - \bar{X})^2$
19	-17.25	297.5625	2,975.63
28	-8.25	68.0625	1,429.31
37	.75	.5625	5.63
46	9.75	95.0625	76.05
55	18.75	351.5625	1,757.81
64	27.75	770.0625	4,620.38
			10,864.81

$$s^2 = \frac{10864.81}{59} \cong 184.149$$

$$s = \sqrt{184.149} = 13.57 \text{ years}$$

Bowerman - Chapter 02 #280

Difficulty: Medium

Learning Objective: N/A

A CFO is looking at the percentage of a company's resources are spent on computing. The CFO samples companies in the pharmaceutical industry and developed the following stem-and-leaf display.

5	269
6	255568999
7	11224557789
8	001222458
9	02455679
10	1556
11	137
12	
13	255

Bowerman - Chapter 02

281. What is the approximate shape of the distribution of the data?

Skewed to the right

Bowerman - Chapter 02 #281

Difficulty: Medium

Learning Objective: 02-04 Differentiate between a symmetrical distribution and a positively or negatively skewed distribution

282. What is the smallest percent spent on computing?

5.2

Bowerman - Chapter 02 #282

Difficulty: Medium

Learning Objective: 02-03 Identify when a histogram should be used

283. If a frequency histogram were to be created using these data, how many classes would you create?

6

Bowerman - Chapter 02 #283

Difficulty: Medium

Learning Objective: 02-02 Describe how a histogram is constructed

284. Personnel managers usually want to know where a job applicant ranked in an entrance test for their company. With a score of 3.83, Michelle Robinson ranked above the 93rd percentile of the other applicants. What is the percentile rank of an applicant whose score was the median value?

50th

Bowerman - Chapter 02 #284

Difficulty: Easy

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

285. The Rivertown city council is attempting to choose one of two sites (A or B) as the location for its new emergency facility. After the new emergency facility becomes available for service, the current emergency facility will be shut down. The project manager has estimated the following response times in minutes from each of the proposed sites to the four areas that must be served by the emergency facility.

	Area Served			
Proposed Site	1	2	3	4
A	5.2	4.4	3.6	6.5
B	6.0	7.4	3.4	4.0

The number of emergency runs from the current emergency facility to each of the four areas over the past year is as follows:

Area	1	2	3	4
Number of runs	150	65	175	92

Compute the weighted mean response time from both proposed locations and determine which proposed site should be selected for the new emergency facility.

μ_A = 6.01, μ_B = 6.14, choose site A.

$$\mu_A = \frac{150(5.2)+65(4.4)+175(3.6)+92(6.5)}{150+65+75+92} = \frac{2294}{382} \cong 6.01 \text{ min}.$$

$$\mu_B = \frac{150(6)+65(7.4)+175(3.4)+92(4)}{150+65+75+92} = \frac{2344}{382} \cong 6.14 \text{ min}.$$

Bowerman - Chapter 02 #285

Difficulty: Hard

Learning Objective: N/A

286. Consider the following data:

1.	11.5	6.	13.7	11.	11	16.	14.5
2.	13.5	7.	14	12.	13	17.	15.5
3.	12.5	8.	12	13.	16.7	18.	13
4.	15.2	9.	12.7	14.	12.5	19.	18.2
5.	14.7	10.	12.5	15.	11.5	20.	11.7

(a) Create a stem and leaf display for the sample.

(b) Describe the shape of the stem and leaf display.

(c) What is the mode?

(d) What is the media?

(a) Stem and leaf of C1, N = 20 Leaf Unit = 0.10

4	11	0557
9	12	05557
(4)	13	0057
7	14	057
4	15	25
2	16	7
1	17	
1	18	2

(b) Single peaked, skewed to the right.

(c) 12.5

(d) 13.0

Bowerman - Chapter 02 #286

Difficulty: Hard

Learning Objective: 02-01 Explain what is demonstrated by a stem-and-leaf display that you have constructed

Learning Objective: 02-04 Differentiate between a symmetrical distribution and a positively or negatively skewed distribution

Learning Objective: 02-06 Distinguish between a mean; a median; and a mode

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