

## 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,  $Q_1$ ?

- A. 25<sup>th</sup>
- B. 50<sup>th</sup>
- C. 75<sup>th</sup>
- D. 100<sup>th</sup>
- E. 125<sup>th</sup>

26. Which percentile describes the third quartile,  $Q_3$ ?

- A. 25<sup>th</sup>
- B. 50<sup>th</sup>
- C. 75<sup>th</sup>
- D. 100<sup>th</sup>
- E. 125<sup>th</sup>

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<sup>th</sup> 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 90<sup>th</sup> 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<sup>th</sup> percentile?

- A. 65.5
- B. 67.3
- C. 66.75
- D. 73.85
- E. 77.0

139.What is the 65<sup>th</sup> 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<sup>th</sup> 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<sup>th</sup> percentile?

- A. 9
- B. 8
- C. 7
- D. 6
- E. 5

147. What is the 65<sup>th</sup> 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<sup>th</sup> 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<sup>th</sup> percentile?

- A. 8
- B. 22.9
- C. 18.55
- D. 9
- E. 21.25

155.What is the 65<sup>th</sup> 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 90<sup>th</sup> 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<sup>th</sup> percentile?

- A. 73
- B. 68
- C. 70.5
- D. 67
- E. 75

163.What is the 65<sup>th</sup> 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<sup>th</sup> 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<sup>th</sup> percentile?

- A. 0.752
- B. 0.55
- C. 0.85
- D. 0.8425
- E. 0.57

171. What is the 65<sup>th</sup> 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<sup>th</sup> 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<sup>th</sup> percentile?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 4.8

179.What is the 65<sup>th</sup> 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 90<sup>th</sup> 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 10<sup>th</sup> percentile?

- A. \$1,304.50
- B. \$2,617
- C. \$3,415.75
- D. \$3,587
- E. \$4,212

187.What is the 65<sup>th</sup> 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<sup>th</sup> 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<sup>th</sup> percentile?

- A. 99
- B. 119.8
- C. 128.8
- D. 112
- E. 122.5

195.What is the 65<sup>th</sup> 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<sup>th</sup> 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<sup>th</sup> percentile?

- A. 335.5
- B. 370.5
- C. 380.6
- D. 200
- E. 375

203.What is the 65<sup>th</sup> 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<sup>th</sup> 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<sup>th</sup> percentile?

- A. 7
- B. 10.35
- C. 12.1
- D. 11
- E. 8

211.What is the 65<sup>th</sup> 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                           |

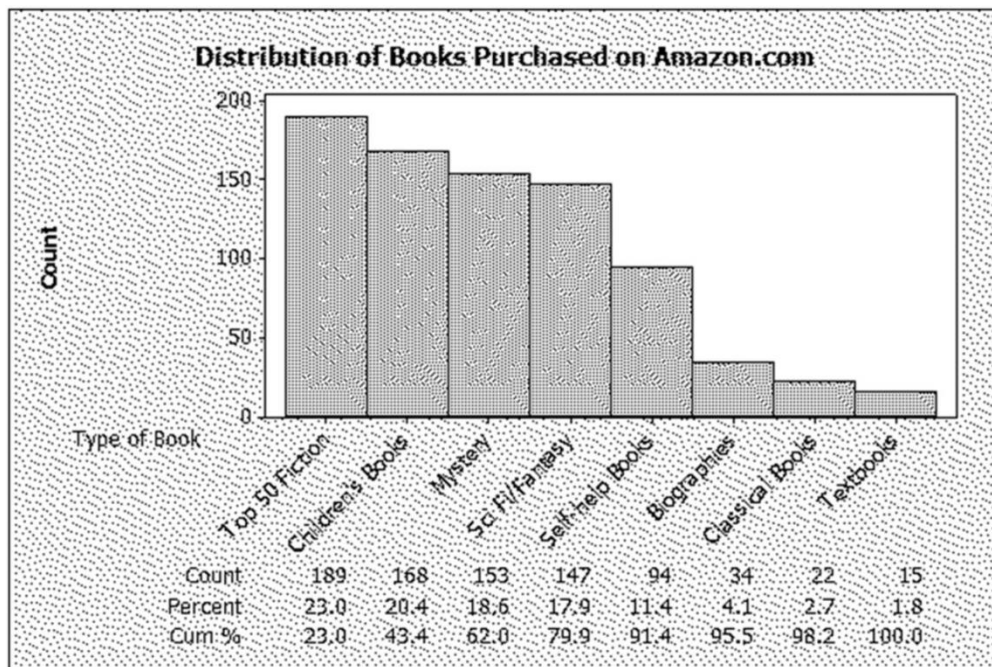
220.What proportion of the students who rated their instructor as very or somewhat effective received a B or better in the class?

- 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<sup>th</sup> 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<sup>th</sup> 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.

| <u>Year</u> | <u>P/E Ratio</u> |
|-------------|------------------|
| 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 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.

| <u>Age of the shopper</u> | <u>Frequency</u> |
|---------------------------|------------------|
| 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 93<sup>rd</sup> 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.

| Proposed Site | Area Served |     |     |     |
|---------------|-------------|-----|-----|-----|
|               | 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*

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

**FALSE**

17. A Pareto chart is a type of histogram.

**FALSE**

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

**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

*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<sup>th</sup>
- B. 50<sup>th</sup>
- C. 75<sup>th</sup>
- D. 100<sup>th</sup>
- E. 125<sup>th</sup>

*Accessibility: Keyboard Navigation*

*Bowerman - Chapter 02 #25*

*Difficulty: Easy*

*Learning Objective: N/A*

26. Which percentile describes the third quartile, Q3?

- A. 25<sup>th</sup>
- B. 50<sup>th</sup>
- C. 75<sup>th</sup>
- D. 100<sup>th</sup>
- E. 125<sup>th</sup>

*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<sup>th</sup> 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

*Bowerman - Chapter 02*

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*

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*

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

*Bowerman - Chapter 02*

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

*Bowerman - Chapter 02*

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*

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 manufactures 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

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<sup>th</sup> 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 10<sup>th</sup> 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 65<sup>th</sup> 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 90<sup>th</sup> 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 10<sup>th</sup> 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 65<sup>th</sup> 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<sup>th</sup> 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 10<sup>th</sup> 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 65<sup>th</sup> 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<sup>th</sup> 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 10<sup>th</sup> 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 65<sup>th</sup> 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<sup>th</sup> 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 10<sup>th</sup> 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 65<sup>th</sup> 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<sup>th</sup> 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 10<sup>th</sup> 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 65<sup>th</sup> 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 90<sup>th</sup> 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 10<sup>th</sup> 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 65<sup>th</sup> 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<sup>th</sup> percentile?

- A. 100.8
- B. 119.8
- C. 130
- D. 112
- E. 122.5

*Accessibility: Keyboard Navigation*

*Bowerman - Chapter 02 #191*

*Difficulty: Medium*

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 10<sup>th</sup> 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 65<sup>th</sup> 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 manufactures 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<sup>th</sup> 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 10<sup>th</sup> 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 65<sup>th</sup> 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<sup>th</sup> 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 10<sup>th</sup> 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 65<sup>th</sup> 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:

*Bowerman - Chapter 02*

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

*Bowman - 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                           |

*Bowman - 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

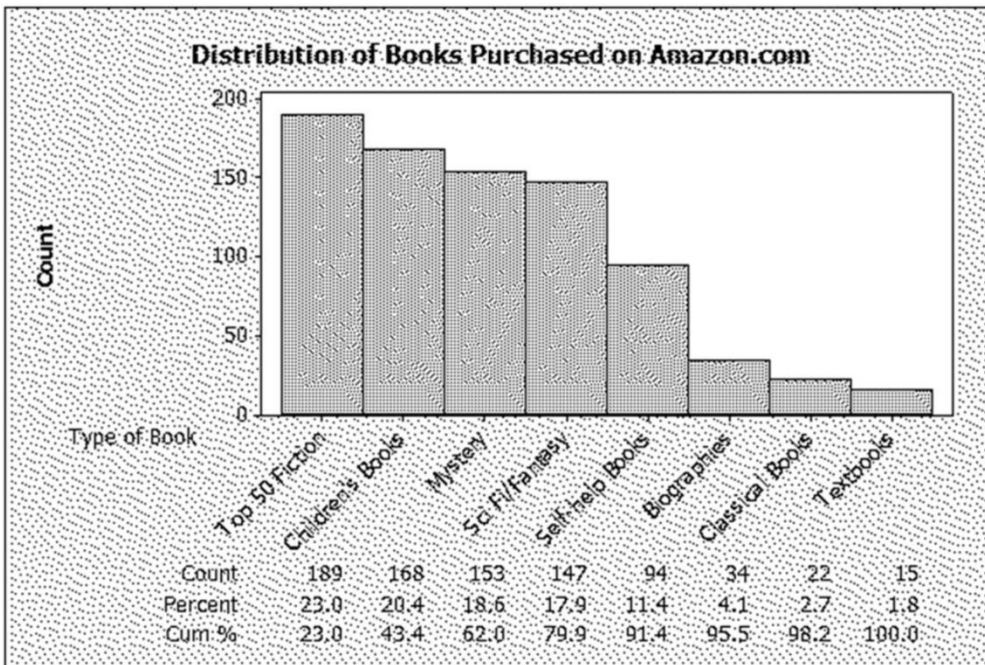
E. 0.15

*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. 43.43

*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<sup>th</sup> 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<sup>th</sup> 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

$$\text{Range} = 24 - 9 = 15$$

*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

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

*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*

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

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

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

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?

$$300 \text{ Interquartile range} = 950 - 650 = 300$$

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?

$$5 \text{ Interquartile range} = 42 - 37 = 5$$

*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*

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

$$1 - \frac{1}{k^2} = .90$$

$$\frac{1}{k^2} = 0.1$$

$$k^2 = \frac{1}{.1} = 10; \quad k = \sqrt{10} = 3.162$$

$$\text{lower bound} = 73.75 - (3.162)(6.5) \cong 53.2$$

$$\text{upper bound} = 73.75 + (3.162)(6.5) = 94.3$$

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.

| <u>Year</u> | <u>P/E Ratio</u> |
|-------------|------------------|
| 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%

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

*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%

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

*Bowerman - Chapter 02 #277*

*Difficulty: Medium*

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.

| <u>Age of the shopper</u> | <u>Frequency</u> |
|---------------------------|------------------|
| 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<br>shopper | Frequency | Class Midpoint | $f_i M_i$  |
|-----------------------|-----------|----------------|------------|
| 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             | <u>384</u> |
|                       |           |                | 2175       |

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

*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            | <u>4,620.38</u>        |
|                          |                 |                     | 10,864.81              |

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

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

*Bowman - 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         |

*Bowman - 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 93<sup>rd</sup> percentile of the other applicants. What is the percentile rank of an applicant whose score was the median value?

50<sup>th</sup>

*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.

| Proposed Site | Area Served |     |     |     |
|---------------|-------------|-----|-----|-----|
|               | 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.

$\mu_A = 6.01$ ,  $\mu_B = 6.14$ , choose site A.

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

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

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

## Chapter 2 Summary

| <u>Category</u>                                                                                                               | <u># of Questions</u> |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Accessibility: Keyboard Navigation                                                                                            | 202                   |
| Bowerman - Chapter 02                                                                                                         | 327                   |
| Difficulty: Easy                                                                                                              | 76                    |
| Difficulty: Hard                                                                                                              | 38                    |
| Difficulty: Medium                                                                                                            | 172                   |
| Learning Objective: 02-01 Explain what is demonstrated by a stem-and-leaf display that you have constructed                   | 11                    |
| Learning Objective: 02-02 Describe how a histogram is constructed                                                             | 19                    |
| Learning Objective: 02-03 Identify when a histogram should be used                                                            | 8                     |
| Learning Objective: 02-04 Differentiate between a symmetrical distribution and a positively or negatively skewed distribution | 11                    |
| Learning Objective: 02-05 Define the term outlier                                                                             | 24                    |
| Learning Objective: 02-06 Distinguish between a mean; a median; and a mode                                                    | 51                    |
| Learning Objective: 02-07 Compute the variance and standard deviation from raw data                                           | 75                    |
| Learning Objective: N/A                                                                                                       | 96                    |