

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 the 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 the measurement 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 mode.
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 and above which approximately 50 percent of the measurements lie.
True False
12. An independent variable is a predictor 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. The sample cumulative distribution function is non-decreasing.
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 numeric characteristic of a sample is a(n) _____.
A. Mean
B. Variance
C. Statistic
D. Parameter
E. Scale
21. All of the following are used to describe quantitative data except the _____.
A. Histogram
B. Stem and Leaf
C. Dot Plot
D. Pie Chart
E. Scatterplot
22. All of the following are measures of central tendency except the _____.
A. Range
B. Mode
C. Mean
D. Median
23. An observation separated from the rest of the data is a(n) _____.
A. Absolute extreme
B. Outlier
C. Mode
D. Quartile
E. Median
24. Which of the following graphs is for qualitative data?
A. Histogram
B. Bar Chart
C. Time series plot
D. Stem and leaf
E. Scatterplot
25. Which percentile describes the first quartile, Q1?
A. 25th
B. 50th
C. 75th
D. 100th
E. 125th

26. Which percentile describes the third quartile, Q3?
- A. 25th
 - B. 50th
 - C. 75th
 - D. 100th
 - E. 125th
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. Bar
28. A Stem and Leaf display is best used to _____
- A. Provide a point estimate of the variability of the data set.
 - B. Provide a point estimate of the central tendency of the data set.
 - C. Display the shape of the distribution.
 - D. Both (A) and (B) are correct
 - E. None of the above (A, B, and C) are correct
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 plot histogram
 - C. stem and leaf display scatter plot
 - D. scatter plot box plot
 - E. box plot 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 pie chart
 - E. scatter plot pie chart
31. A _____ shows the relationship between two variables
- A. Box plot
 - B. Bar chart
 - C. Histogram
 - D. Scatter Plot
 - E. Pie chart
32. In a given data set the 25th percentile is _____ equal 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. _____ are used to describe qualitative (categorical) data.
- A. Stem and leaf displays and scatter plots.
 - B. Scatter plots and box plots
 - C. Box plots and bar charts
 - D. Bar charts and pie charts
 - E. Pie charts and 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. Geometric mean
 - E. Weighted mean
36. If a population distribution is positively 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 all equal 25, 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 two samples:
- A. Standard deviations
 - B. Variances
 - C. Coefficient of variations
 - 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 (group), intervals should be _____.
A. large.
B. small.
C. integer.
D. mutually exclusive.
E. equal.
42. When using the Chebyshev's theorem to obtain the bounds for a 99.73 percent of the values in a population, the interval generally will be _____ the interval obtained for the same percentage if normal distribution is assumed (empirical rule).
A. Shorter than
B. Wider than
C. The same as
43. 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
44. 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
45. 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
46. As a measure of variation, the sample _____ is easy to understand and compute. It is based on the two extreme values and is therefore a highly unstable measure.
A. Range
B. Standard deviation
C. Variance
D. Interquartile range
E. Coefficient of variation
47. 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
48. 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

49. 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
50. 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

Use the following to answer questions 51-55:

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

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

51. 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
52. What is the smallest percent spent on computing?
- A. 5.9
 - B. 5.6
 - C. 5.2
 - D. 5.02
 - E. 50.2
53. 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
54. 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

55. 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

Use the following to answer questions 56-58:

A local airport keeps track of the percentage of flights arriving within 15 minutes of their scheduled

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

arrivals. The stem-and-leaf plot of the data for one year is below:

56. What is the sample size?

- A. 7
- B. 9
- C. 10
- D. 11
- E. 12

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

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

58. 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

Use the following to answer questions 59-61:

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

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

distribution shown below:

59. 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

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

- A. .132
- B. .226
- C. .231
- D. .283
- E. .288

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

- A. 22.5
- B. 27.5
- C. 32.5
- D. 37.5
- E. 42.5

Use the following to answer questions 62-64:

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

62. What is the mean?

- A. 71.5
- B. 72.0
- C. 77.0
- D. 71.0
- E. 73.0

63. What is the median?

- A. 71.5
- B. 72.0
- C. 77.0
- D. 71.0
- E. 73.0

64. What is the mode?

- A. 71.5
- B. 72.0
- C. 77.0
- D. 71.0
- E. 73.0

Use the following to answer questions 65-67:

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

65. What is the mean?

- A. 8.0
- B. 7.0
- C. 6.0
- D. 9.0
- E. 7.4

66. What is the median?

- A. 8.0
- B. 7.0
- C. 6.0
- D. 9.0
- E. 7.4

67. What is the mode?

- A. 8.0
- B. 7.0
- C. 6.0
- D. 9.0
- E. 7.4

Use the following to answer questions 68-70:

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

68. What is the mean?

- A. 8
- B. 23.5
- C. 16
- D. 17
- E. 18

69. What is the median?

- A. 8
- B. 23.5
- C. 16
- D. 17
- E. 18

70. What is the mode?

- A. 8
- B. 23.5
- C. 16
- D. 17
- E. 18

Use the following to answer questions 71-73:

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

71. What is the mean?

- A. 70
- B. 75
- C. 68
- D. 71
- E. 80

72. What is the median?

- A. 70
- B. 75
- C. 68
- D. 71
- E. 80

73. What is the mode?

- A. 70
- B. 75
- C. 68
- D. 71
- E. 80

Use the following to answer questions 74-76:

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

74. What is the mean?
- A. 0.709
 - B. 0.710
 - C. 0.920
 - D. 0.725
 - E. 0.550
75. What is the median?
- A. 0.709
 - B. 0.710
 - C. 0.920
 - D. 0.725
 - E. 0.550
76. What is the mode?
- A. 0.709
 - B. 0.710
 - C. 0.920
 - D. 0.725
 - E. 0.550

Use the following to answer questions 77-79:

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

77. What is the mean?
- A. 3
 - B. 5
 - C. 2
 - D. 4
 - E. 3.25
78. What is the median?
- A. 3
 - B. 5
 - C. 2
 - D. 4
 - E. 3.25
79. What is the mode?
- A. 3
 - B. 5
 - C. 2
 - D. 4
 - E. 3.25

Use the following to answer questions 80-82:

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

80. What is the mean?

- A. 3447
- B. 3213
- C. 3250
- D. 6120
- E. 3445

81. What is the median?

- A. 3447
- B. 3213
- C. 3250
- D. 6120
- E. 3445

82. What is the mode?

- A. 3447
- B. 3213
- C. 3250
- D. 6120
- E. 3445

Use the following to answer questions 83-85:

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

83. What is the mean?

- A. 114.15
- B. 118
- C. 148
- D. 45
- E. 115.5

84. What is the median?

- A. 114.15
- B. 118
- C. 148
- D. 45
- E. 115.5

85. What is the mode?

- A. 114.15
- B. 118
- C. 148
- D. 45
- E. 115.5

Use the following to answer questions 86-88:

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

86. What is the mean?
A. 375
B. 368
C. 389.9
D. 200
E. 346.6
87. What is the median?
A. 375
B. 368
C. 389.9
D. 200
E. 346.6
88. What is the mode?
A. 375
B. 368
C. 389.9
D. 200
E. 346.6

Use the following to answer questions 89-91:

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

89. What is the mean?
A. 8
B. 9.6
C. 9.5
D. 10.5
E. 9
90. What is the median?
A. 8
B. 9.6
C. 9.5
D. 10.5
E. 9
91. What is the mode?
A. 8
B. 9.6
C. 9.5
D. 10.5
E. 9
92. 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. 67

93. 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
94. Find the z-score for an IQ test score of 922 when the mean is 100 and the standard deviation is 15.
A. 0.53
B. 0.77
C. -0.77
D. -0.53
E. -8.00
95. 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
96. 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
97. 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]

Use the following to answer questions 98-100:

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.

98. What are the times that approximately 68.26% of all workers will 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]
99. What are the times that approximately 95.44% of all workers will 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]

100. What are the times that approximately 99.73% of all workers will 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]
101. According to Chebyshev's Theorem, at least what proportion of the data will be within $\mu \pm k\sigma$ for $k = 2$?
- A. 68%
 - B. 50%
 - C. 25%
 - D. 75%
 - E. 34%
102. According to Chebyshev's Theorem, at least what proportion of the data will be within $\mu \pm k\sigma$ for $k = 2.5$?
- A. 16%
 - B. 40%
 - C. 68%
 - D. 60%
 - E. 84%
103. According to Chebyshev's Theorem, at least what proportion of the data will be within $\mu \pm k\sigma$ for $k = 1.6$?
- A. 39%
 - B. 58%
 - C. 68%
 - D. 61%
 - E. 92%
104. According to Chebyshev's Theorem, at least what proportion of the data will be within $\mu \pm k\sigma$ for $k = 3.2$?
- A. 90%
 - B. 95%
 - C. 84%
 - D. 97%
 - E. 10%
105. According to Chebyshev's theorem, how many standard deviations from the range would include at least 80% of the values?
- A. 5.0
 - B. 2.2
 - C. 2.5
 - D. 1.6
 - E. 2.0

Use the following to answer questions 106-108:

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

106. What is the range?
- A. 22.72
 - B. 12.00
 - C. 4.77
 - D. 516.20
 - E. 144.00

107. What is the variance?

- A. 22.72
- B. 12.00
- C. 4.77
- D. 516.20
- E. 144.00

108. What is the standard deviation?

- A. 22.72
- B. 12.00
- C. 4.77
- D. 516.20
- E. 144.00

Use the following to answer questions 109-111:

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

109. What is the range?

- A. 1.183
- B. 1.400
- C. 4.00
- D. 16.00
- E. 1.96

110. What is the variance?

- A. 1.183
- B. 1.400
- C. 4.00
- D. 16.00
- E. 1.96

111. What is the standard deviation?

- A. 1.183
- B. 1.400
- C. 4.00
- D. 16.00
- E. 1.96

Use the following to answer questions 112-114:

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

112. What is the range?

- A. 39.14
- B. 6.26
- C. 17
- D. 289
- E. 18

113. What is the variance?

- A. 39.14
- B. 6.26
- C. 17
- D. 289
- E. 18

114. What is the standard deviation?

- A. 39.14
- B. 6.26
- C. 17
- D. 289
- E. 18

Use the following to answer questions 115-117:

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

115. What is the range?

- A. 18
- B. 4.73
- C. 22.40
- D. 324
- E. 6.76

116. What is the variance?

- A. 18
- B. 4.73
- C. 22.40
- D. 324
- E. 6.76

117. What is the standard deviation?

- A. 18
- B. 4.73
- C. 22.40
- D. 324
- E. 6.76

Use the following to answer questions 118-120:

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)

118. What is the range?

- A. 0.026
- B. 0.052
- C. 0.580
- D. 0.1613
- E. 0.0007

119. What is the variance?

- A. 0.026
- B. 0.052
- C. 0.580
- D. 0.1613
- E. 0.0007

120. What is the standard deviation?

- A. 0.026
- B. 0.052
- C. 0.580
- D. 0.1613
- E. 0.0007

Use the following to answer questions 121-123:

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

121. What is the range?

- A. 3
- B. 4
- C. 1.291
- D. 1.667
- E. 2.779

122. What is the variance?

- A. 3
- B. 4
- C. 1.291
- D. 1.667
- E. 2.779

123. What is the standard deviation?

- A. 3
- B. 4
- C. 1.291
- D. 1.667
- E. 2.779

Use the following to answer questions 124-126:

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

124. What is the range?

- A. 1359
- B. 4993
- C. 1846575
- D. 3587
- E. 1976454

125. What is the variance?

- A. 1359
- B. 4993
- C. 1846575
- D. 3587
- E. 1976454

126. What is the standard deviation?

- A. 1359
- B. 4993
- C. 1846575
- D. 3587
- E. 1976454

Use the following to answer questions 127-129:

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

127. What is the range?

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

128. What is the variance?

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

129. What is the standard deviation?

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

Use the following to answer questions 130-132:

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

130. What is the range?

- A. 342.43
- B. 3424.3
- C. 58.5
- D. 191
- E. 10609

131. What is the variance?

- A. 342.43
- B. 3424.3
- C. 58.5
- D. 191
- E. 10609

132. What is the standard deviation?

- A. 342.43
- B. 3424.3
- C. 58.5
- D. 191
- E. 10609

Use the following to answer questions 133-135:

Time to degree has become a "hot" topic with federal legislators. At one state university it was necessary to do a quick calculation when one of the local congressmen called the president. Twenty students were randomly selected from the most recent graduating class and 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

133. What is the range?

- A. 8
- B. 2.162
- C. 9.5
- D. 4.674
- E. 21.846

134. What is the variance?

- A. 8
- B. 2.162
- C. 9.5
- D. 4.674
- E. 21.846

135. What is the standard deviation?

- A. 8
- B. 2.162
- C. 9.5
- D. 4.674
- E. 21.846

Use the following to answer questions 136-143:

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

136. What is the 90th percentile?

- A. 77
- B. 73
- C. 74
- D. 67
- E. 65.9

137. What is the third quartile?

- A. 65.9
- B. 67.3
- C. 66.75
- D. 73.85
- E. 77.0

138. What is the first quartile?

- A. 65.9
- B. 67.3
- C. 66.75
- D. 73.85
- E. 77.0

139. What is the 10th percentile?

- A. 65.9
- B. 67.3
- C. 66.75
- D. 73.85
- E. 77.0

140. What is the 65th percentile?

- A. 65.9
- B. 67.3
- C. 66.75
- D. 73.85
- E. 77.0

141. What is the IQR?

- A. 12.00
- B. 5.25
- C. 10.25
- D. 5.00
- E. 11.00

142. What are the inner fences?

- A. 15.375, 30.75
- B. 82.125, 92.375
- C. 97.50, 107.75
- D. 51.375, 92.375
- E. 35.95, 107.75

143. What are the outer fences?

- A. 15.375, 30.75
- B. 51.375, 92.375
- C. 35.95, 107.75
- D. 82.125, 92.375
- E. 97.50, 107.75

Use the following to answer questions 144-151:

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

144. What is the 90th percentile?

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

145. What is the third quartile?

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

146. What is the first quartile?

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

147. What is the 10th percentile?

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

148. What is the 65th percentile?

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

149. What is the IQR?

- A. 15
- B. 1.5
- C. 3
- D. 4
- E. 1

150. 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

151. 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

Use the following to answer questions 152-159:

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

152. What is the 90th percentile?

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

153. What is the third quartile?

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

154. What is the first quartile?

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

155. What is the 10th percentile?

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

156. What is the 65th percentile?

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

157. What is the IQR?

- A. 12.25
- B. 18.375
- C. 36.75
- D. 21.25
- E. 30.25

158. What are the inner fences?

- A. 27.375, 39.625
- B. -9.375, 39.625
- C. -27.75, 58.00
- D. 45.75, 58.00
- E. 18.375, 36.75

159. What are the outer fences?

- A. -9.375, 39.625
- B. -27.75, 58.00
- C. 27.375, 39.625
- D. 45.75, 58.00
- E. 18.375, 36.75

Use the following to answer questions 160-167:

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

160. What is the 90th percentile?

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

161. What is the third quartile?

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

162. What is the first quartile?

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

163. What is the 10th percentile?

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

164. What is the 65th percentile?

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

165. What is the IQR?

- A. 18
- B. 6
- C. 5
- D. 7.5
- E. 15

166. 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

167. 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

Use the following to answer questions 168-175:

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

168. What is the 90th percentile?

- A. 0.752
- B. 0.552
- C. 0.85
- D. 0.8425
- E. 0.57

169. What is the third quartile?

- A. 0.752
- B. 0.552
- C. 0.85
- D. 0.8425
- E. 0.57

170. What is the first quartile?

- A. 0.752
- B. 0.552
- C. 0.85
- D. 0.8425
- E. 0.57

171. What is the 10th percentile?

- A. 0.752
- B. 0.552
- C. 0.85
- D. 0.8425
- E. 0.57

172. What is the 65th percentile?

- A. 0.752
- B. 0.552
- C. 0.85
- D. 0.8425
- E. 0.57

173. What is the IQR?

- A. .2725
- B. .8175
- C. .40875
- D. .57
- E. .8425

174. What are the inner fences?

- A. .97875, 1.25125
- B. 1.3875, 1.66
- C. -.2475, 1.66
- D. .40875, .8175
- E. .16125, 1.25125

175. What are the outer fences?

- A. -.2475, 1.66
- B. .16125, 1.25125
- C. .97875, 1.25125
- D. 1.3875, 1.66
- E. .40875, .8175

Use the following to answer questions 176-183:

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

176. What is the 90th percentile?

- A. 1.2
- B. 2
- C. 3
- D. 4
- E. 4.8

177. What is the third quartile?

- A. 1.2
- B. 2
- C. 3
- D. 4
- E. 4.8

178. What is the first quartile?

- A. 1.2
- B. 2
- C. 3
- D. 4
- E. 4.8

179. What is the 10th percentile?

- A. 1.2
- B. 2
- C. 3
- D. 4
- E. 4.8

180. What is the 65th percentile?

- A. 1.2
- B. 2
- C. 3
- D. 4
- E. 4.8

181. What is the IQR?

- A. 2
- B. 6
- C. 3
- D. 4
- E. 1

182. What are the inner fences?

- A. -1, 7
- B. -4, 10
- C. 5, 7
- D. 8, 10
- E. 3, 6

183. What are the outer fences?

- A. -1, 7
- B. -4, 10
- C. 5, 7
- D. 8, 10
- E. 3, 6

Use the following to answer questions 184-191:

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

184. What is the 90th percentile?

- A. \$1,446.5
- B. \$2,617
- C. \$3,415.75
- D. \$3,587
- E. \$4,212

185. What is the third quartile?

- A. \$1,446.5
- B. \$2,617
- C. \$3,415.75
- D. \$3,587
- E. \$4,212

186. What is the first quartile?

- A. \$1,446.5
- B. \$2,617
- C. \$3,415.75
- D. \$3,587
- E. \$4,212

187. What is the 10th percentile?

- A. \$1,446.5
- B. \$2,617
- C. \$3,415.75
- D. \$3,587
- E. \$4,212

188. What is the 65th percentile?

- A. \$1,446.5
- B. \$2,617
- C. \$3,415.75
- D. \$3,587
- E. \$4,212

189. What is the IQR?

- A. 1455
- B. 970
- C. 2910
- D. 4993
- E. 6204

190. What are the inner fences?

- A. 1455, 2910
- B. 4072, 5042
- C. 5527, 6497
- D. 1162, 5042
- E. -293, 6497

191. What are the outer fences?

- A. 1455, 2910
- B. 4072, 5042
- C. 5527, 6497
- D. 1162, 5042
- E. -293, 6497

Use the following to answer questions 192-199:

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

192. What is the 90th percentile?

- A. 100.8
- B. 119.8
- C. 128.8
- D. 112
- E. 122.5

193. What is the third quartile?

- A. 100.8
- B. 119.8
- C. 128.8
- D. 112
- E. 122.5

194. What is the first quartile?

- A. 100.8
- B. 119.8
- C. 128.8
- D. 112
- E. 122.5

195. What is the 10th percentile?

- A. 100.8
- B. 119.8
- C. 128.8
- D. 112
- E. 122.5

196. What is the 65th percentile?

- A. 100.8
- B. 119.8
- C. 128.8
- D. 112
- E. 122.5

197. What is the IQR?

- A. 21.00
- B. 10.50
- C. 15.75
- D. 31.50
- E. 11.50

198. What are the inner fences?

- A. 96.25, 138.25
- B. 80.5, 154.00
- C. 127.75, 138.25
- D. 143.50, 154.00
- E. 15.75, 31.50

199. What are the outer fences?

- A. 96.25, 138.25
- B. 80.5, 154.00
- C. 127.75, 138.25
- D. 143.50, 154.00
- E. 15.75, 31.50

Use the following to answer questions 200-207:

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

200. What is the 90th percentile?

- A. 335.5
- B. 370.5
- C. 380.6
- D. 296.8
- E. 375

201. What is the third quartile?

- A. 335.5
- B. 370.5
- C. 380.6
- D. 296.8
- E. 375

202. What is the first quartile?

- A. 335.5
- B. 370.5
- C. 380.6
- D. 296.8
- E. 375

203. What is the 10th percentile?

- A. 335.5
- B. 370.5
- C. 380.6
- D. 296.8
- E. 375

204. What is the 65th percentile?

- A. 335.5
- B. 370.5
- C. 380.6
- D. 296.8
- E. 375

205. What is the IQR?

- A. 41
- B. 22
- C. 61.50
- D. 191
- E. 82

206. What are the inner fences?

- A. 274.0, 438.0
- B. 212.5, 499.5
- C. 397.0, 438.0
- D. 458.5, 499.5
- E. 61.5, 123.0

207. What are the outer fences?

- A. 274.0, 438.0
- B. 212.5, 499.5
- C. 397.0, 438.0
- D. 458.5, 499.5
- E. 61.5, 123.0

Use the following to answer questions 208-215:

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

208. What is the 90th percentile?

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

209. What is the third quartile?

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

210. What is the first quartile?

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

211. What is the 10th percentile?

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

212. What is the 65th percentile?

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

213. What is the IQR?

- A. 3
- B. 8
- C. 3.5
- D. 11
- E. 4.5

214. 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

215.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

Use the following to answer questions 216-220:

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:

216.Think their instructor was "very effective"

- A. 0.136
- B. 0.536
- C. 0.182
- D. 0.280
- E. 0.014

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

- A. 0.189
- B. 0.811
- C. 0.009
- D. 0.656
- E. 0.151

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

- A. 0.251
- B. 0.620
- C. 0.129
- D. 0.871
- E. 0.340

219.Think that they had a "very ineffective" or "extremely ineffective" instructor

- A. 0.282
- B. 0.136
- C. 0.182
- D. 0.280
- E. 0.464

220. 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

Use the following to answer questions 221-222:

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

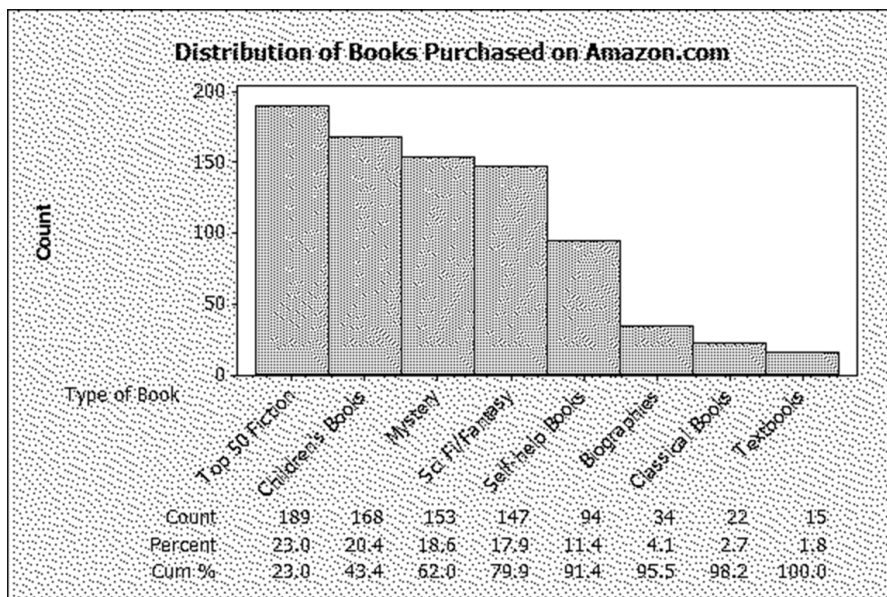
	Very or Somewhat Effective	Very or Somewhat Ineffective
Final Grade		
A	190	85
B	75	120
C	20	17
D	9	18
F	1	15

instructor:

221. 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
222. 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

Use the following to answer questions 223-225:

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:



223. 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
224. 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
225. What percentage of books were in the top two categories?
A. 22.99
B. 20.44
C. 4.50
D. 43.43
E. .4343
226. A graphical display of categorical data made up of vertical or horizontal bars is called a _____.

227. A flaw possessed by a population or sample unit is a _____.

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

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

230. Another name for the 50th percentile is the _____.

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

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

233. It is suggested that samples of data, a _____ be constructed to determine the shape of the data.

234. The number of measurements falling within a class interval is called the _____.

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

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

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

238. The percentage of measurements in a class is called the _____ of that class.

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

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

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

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

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

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

245. 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 90th percentile?

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

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

248. Compute the mode of the data 32,33,22,28,24,23,27,24,27,21.

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

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

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

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

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

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

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

256. 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.

257. 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.

258. 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.

259. 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?

- 260.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?
- 261.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?
- 262.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?
- 263.Determine the median of the data set 95,86,78,90,62,73,89,92,84,76.
- 264.Compute the sample standard deviation of the data set 6,4,2,1,4,1
- 265.If 50 of 500 sampled customers said they would make a purchase of a new TV set, what is the sample proportion?

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

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

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

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

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

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

272. 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?

273. 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.

Use the following to answer questions 274-276:

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.

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

275. 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.

276. 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.

Use the following to answer questions 277-278:

The following table shows the Price-to-Earnings ratio for a Stereo equipment manufacturing company

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

between 1998 and 2002.

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

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

279.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

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

below:

Calculate the mean growth rate.

Use the following to answer questions 280-281:

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

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

281. 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.

Use the following to answer 282
A CFO is looking at how much of a company's resources are spent on computing. The CFO samples companies in the pharmaceutical industry and developed the following stem-and-leaf graph.

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

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

283. What is the smallest percent spent on computing?

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

285. Personnel managers usually want to know where a job applicant ranked in an entrance test for their company. With a score of 3.83, Michelle Robinson ranked above the 93rd percentile of the other applicants. What is the percentile rank of an applicant whose score was the median value?
286. 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.

- 287.
- | | | | | | | | |
|----|------|-----|------|-----|------|-----|------|
| 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 |
- Consider the following data:
- Create a stem and leaf display for the sample.
 - Describe the shape of the stem and leaf display.
 - What is the mode?
 - What is the media?

ch02 Key

1. TRUE
2. FALSE
3. TRUE
4. TRUE
5. FALSE
6. TRUE
7. FALSE
8. TRUE
9. FALSE
10. FALSE
11. TRUE
12. TRUE
13. TRUE
14. TRUE
15. FALSE
16. FALSE
17. TRUE
18. FALSE
19. C
20. C
21. D
22. A
23. B
24. B
25. A
26. C
27. B
28. C
29. A
30. B
31. D
32. B
33. E
34. D
35. B
36. E

37. B
38. C
39. C
40. B
41. D
42. B
43. B
44. E
45. C
46. A
47. E
48. D
49. C
50. B
51. B
52. C
53. C
54. A
55. E
56. E
57. A
58. D
59. D
60. D
61. C
62. A
63. B
64. C
65. E
66. B
67. B
68. C
69. D
70. A
71. A
72. C
73. C
74. A

75. D
76. B
77. A
78. A
79. A
80. B
81. C
82. C
83. A
84. B
85. B
86. E
87. B
88. A
89. E
90. C
91. A
92. A
93. B
94. D
95. A
96. C
97. E
98. B
99. D
100. E
101. D
102. E
103. D
104. A
105. B
106. B
107. A
108. C
109. C
110. B
111. A
112. C

- 113. A
- 114. B
- 115. A
- 116. C
- 117. B
- 118. C
- 119. A
- 120. D
- 121. B
- 122. D
- 123. C
- 124. B
- 125. C
- 126. A
- 127. A
- 128. C
- 129. B
- 130. D
- 131. B
- 132. C
- 133. A
- 134. D
- 135. B
- 136. A
- 137. E
- 138. C
- 139. A
- 140. D
- 141. C
- 142. D
- 143. C
- 144. A
- 145. B
- 146. C
- 147. D
- 148. B
- 149. E
- 150. C

151. B
152. B
153. E
154. D
155. A
156. C
157. A
158. B
159. B
160. E
161. A
162. B
163. D
164. C
165. C
166. C
167. C
168. C
169. D
170. E
171. B
172. A
173. A
174. E
175. A
176. E
177. D
178. B
179. A
180. C
181. A
182. A
183. B
184. E
185. D
186. B
187. A
188. C

- 189. B
- 190. D
- 191. E
- 192. C
- 193. E
- 194. D
- 195. A
- 196. B
- 197. B
- 198. A
- 199. B
- 200. C
- 201. B
- 202. A
- 203. D
- 204. E
- 205. A
- 206. A
- 207. B
- 208. C
- 209. D
- 210. E
- 211. A
- 212. B
- 213. A
- 214. B
- 215. B
- 216. A
- 217. B
- 218. C
- 219. E
- 220. A
- 221. D
- 222. C
- 223. B
- 224. A
- 225. D
- 226. Bar Chart

227. Defect

228. Outlier

229. Histogram

230. Median

231. Mode

232. Variance

233. graph

234. Frequency

235. Range

236. Skewed

237. Right or positively

238. Relative frequency

239. positively or to the right

240. negatively or to the left

241. Standard deviation

242. coefficient of variation

243. Bar chart

244. 95.44

245. 12.1

246. 26.1

$$\frac{24 + 27}{2} = 25.5$$

247. 25.5

248. 24 and 27

Range = 24-9 = 15

249. 15

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

250. 20.5

251. 4

252. 8

253. 2

254. 2.77

255. 7

28,475 + 9,369 = 37,844

28,475 - 9,369 = 19,106

256. 19,106 to 37,844

$28,475 + 2(9,369) = 47,213$
 $28,475 - 2(9,369) = 9,737$
257. 9,737 to 47,213

$28,475 + 3(9,369) = 56,582$
 $28,475 - 3(9,369) = 368$
258. 368 to 56,582

Interquartile range = $950 - 650 = 300$
259. 300

Interquartile range = $42 - 37 = 5$
260. 5

$$k = \frac{150 - 110}{20} = 2$$
$$1 - \frac{1}{k^2} = 1 - \frac{1}{4} = .75$$

261. 75%

$$k = \frac{150 - 75}{25} = 3$$
$$1 - \frac{1}{k^2} = 1 - \frac{1}{9} = .8889$$

262. 88.89%

263. 85

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

264. 2

265. .10

266. Skewed-left (negatively skewed)

267. $\mu \pm \sigma$

268. $\mu \pm 3\sigma$

269. $\mu \pm 3\sigma$

270. central tendency, variation, and shape

271. No

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

272. 30

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

273. 1

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

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

274. 55.56%

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

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

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

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

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

275. 53.2 to 94.3

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

276. -0.5

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

277. 17.74%

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

278. -23.97%

279. -12.36%

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

Age of the 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

280. 36.25 years

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

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

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

281. 184.1493 and 13.57

282. Skewed to the right

283. 5.2

284. 6

285. 50th

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

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

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

(d) 13.0

(c) 12.5

(b) Single peaked, skewed right

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

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

ch02 Summary

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BT: Apply (Ap)	1
BT: R	40
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BT: Understand(U)	1
Difficulty: Easy	73
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Difficulty: Medium	162
Learning Objective: 1	12
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Learning Objective: 2	39
Learning Objective: 3	10
Learning Objective: 4	1
Learning Objective: 4 and 6	1
Learning Objective: 5	47
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