ch02

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 relative frequency is the frequency of a class divided by the total number of measurements.
   True False

3. A bar chart is a graphic that can be used to depict qualitative data.
   True False

4. Stem-and-leaf displays and dot plots are useful for detecting outliers.
   True False

5. A scatter plot can be used to identify outliers.
   True False

6. When looking at the shape of the distribution using a stem-and-leaf, a distribution is skewed to the right when the left tail is shorter than the right tail.
   True False

7. When we wish to summarize the proportion (or fraction) of items in a class we use the frequency distribution for each class.
   True False

8. 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

9. The sample cumulative distribution function is non-decreasing.
   True False

10. A frequency table includes row and column percentages.
    True False

11. When constructing any graphical display that utilizes categorical data, classes that have frequencies of 5 percent or less are usually combined together into a single category.
    True False

12. In a Pareto chart, the bar for "Other" category should be placed to the far left of the chart.
    True False

13. In the first step of setting up a Pareto chart, a frequency table should be constructed of the defects (or categories) in decreasing order of frequency.
    True False

14. It is possible to create different interpretations of the same graphical display by simply using different captions.
    True False

15. Beginning the vertical scale of a graph at a value different from zero can cause increases to look more dramatic.
    True False

16. A runs plot is a form of a scatter plot.
    True False

17. The stem-and-leaf display is advantageous because it allows us to actually see the measurements in the data set.
    True False

18. Splitting the stems refers to assigning the same stem to two or more rows of the stem-and-leaf display.
    True False

19. When data are qualitative, the bars should never be separated by gaps.
    True False

20. Each stem of a stem-and-leaf display should be a single digit.
    True False

21. Leaves on a stem-and-leaf display should be rearranged so that they are in increasing order from left to right.
    True False

22. A(n) _____ is a graph of a cumulative distribution.
    A. Histogram
    B. Scatter plot
    C. Ogive plot
    D. Pie Chart

23. _____ can be used to study the relationship between two variables.
    A. Cross-tabulation tables
    B. Frequency tables
    C. Cumulative frequency distributions
    D. Dot plots

24. Row or column percentages can be found in:
    A. Frequency tables
    B. Relative frequency tables
    C. Cross-tabulation tables
    D. Cumulative frequency tables

25. All of the following are used to describe quantitative data except the
    A. Histogram
    B. Stem and Leaf
    C. Dot Plot
    D. Pie Chart

26. An observation separated from the rest of the data is a(n)
    A. Absolute extreme
    B. Outlier
    C. Mode
    D. Quartile

27. Which of the following graphs is for qualitative data?
    A. Histogram
    B. Bar Chart
    C. Ogive plot
    D. Stem And leaf

28. A plot of the values of two variables is a _____ plot.
    A. Runs
    B. Scatter
    C. Dot
    D. Ogive plot

29. 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. None of the above.

30. When grouping a large sample of measurements 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.

31. 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

32. A _____ shows the relationship between two variables.
    A. Stem-and-leaf
    B. Bar chart
    C. Histogram
    D. Scatter Plot
    E. Pie chart

33. A(n) _____ can be used to differentiate the "vital few" causes of quality problems from the "trivial many" causes of quality problems.
    A. Histogram
    B. Scatter plot
    C. Pareto chart
    D. Ogive plot
    E. Stem and leaf display

34. _____ and _____ are used to describe qualitative (categorical) data.
    A. Stem and leaf displays, scatter plots
    B. Scatter plots, histograms
    C. Box plots, bar charts
    D. Bar charts, pie charts
    E. Pie charts, histograms

35. Which one of the following graphical tools is used with quantitative data?
    A. Bar chart
    B. Histogram
    C. Pie chart
    D. Pareto chart

36. When developing a frequency distribution, the class (group) intervals should be
    A. Large.
    B. Small.
    C. Integer.
    D. Mutually exclusive.
    E. Equal.

37. 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

38. All of the following are used to describe qualitative data except the:
    A. Bar chart
    B. Pie chart
    C. Histogram
    D. Pareto Chart

39. 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

40. 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

41. 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

42. 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

43. A CFO is looking at how much of a company's resources are spent on computing. He 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

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

44. A CFO is looking at how much of a company's resources are spent on computing. He 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

What is the smallest percent spent on R&D?

A. 5.9
B. 5.6
C. 5.2
D. 5.02
E. 50.2

45. A CFO is looking at how much of a company's resources are spent on computing. He 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

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

46. A CFO is looking at how much of a company's resources are spent on computing. He 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

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

47. A CFO is looking at how much of a company's resources are spent on computing. He 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

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

48. The US 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:

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

How many flights were used in this plot?
A. 7
B. 9
C. 10
D. 11
E. 12

49. The US 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:

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

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

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

50. The US 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:

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

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

51. 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

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

A. Symmetrical
B. Uniform
C. Multiple peaks
D. Skewed to the left
E. Skewed to the right

52. 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

What is the relative frequency for the largest interval?

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

53. 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

What is the midpoint of the third class interval?
A. 22.5
B. 27.5
C. 32.5
D. 37.5
E. 42.5

54. A graphical display of categorical data made up of vertical or horizontal bars is called a(n) ____.
A. Pie Chart
B. Pareto Chart
C. Bar Chart
D. Ogive Plot

55. A flaw possessed by a population or sample unit is ____.
A. Always random
B. A defect
C. Displayed by a dot plot
D. The cause for extreme skewness to the right

56. A graphical portrayal of a quantitative data set that divides the data into classes and gives the frequency of each class is a(n) ____.
A. Ogive Plot
B. Dot Plot
C. Histogram
D. Pareto Chart
E. Bar Chart

57. The number of measurements falling within a class interval is called the ____.
A. Frequency
B. Relative frequency
C. Leaf
D. Cumulative sum

58. A relative frequency curve having a long tail to the right is said to be ____.
A. Skewed to the left
B. Normal
C. A scatter plot
D. Skewed to the right

59. The percentage of measurements in a class is called the _____ of that class.
A. Frequency
B. Relative frequency
C. Leaf
D. Cumulative percentage

60. A histogram that tails out towards larger values is ____.
A. Skewed to the left
B. Normal
C. A scatter plot
D. Skewed to the right

61. A histogram that tails out towards smaller values is ____.
    A. Skewed to the left
    B. Normal
    C. A scatter plot
    D. Skewed to the right

62. A very simple graph that can be used to summarize a quantitative data set is called a(n) _____.
    A. Runs plot
    B. Ogive plot
    C. Dot plot
    D. Pie chart

63. An example of manipulation of graphical display used to distort reality is:
    A. Zero at the axes
    B. Equal widths of bars in a histogram
    C. Stretched axes
    D. A & C

64. As a general rule, when creating a stem-and-leaf display, there should be between _____ stem values.
    A. 3 and 10
    B. 1 and 100
    C. No fewer than 20
    D. 5 and 20

65. 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

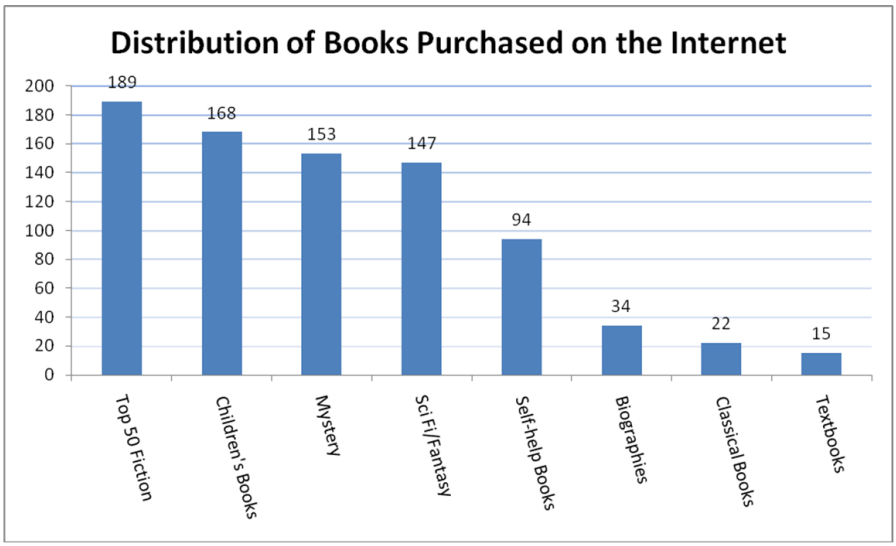
    What proportion of the students who rated their instructor as very or somewhat effective received a B or better in the class?
    A. 0.345
    B. 0.254
    C. 0.482
    D. 0.898
    E. 0.644

66. 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

    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

67. 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

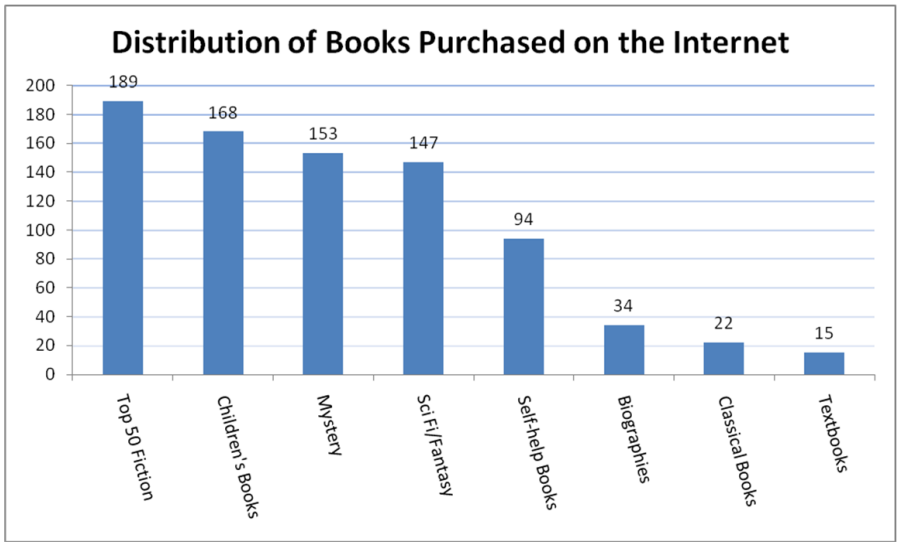


type:

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

68. 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

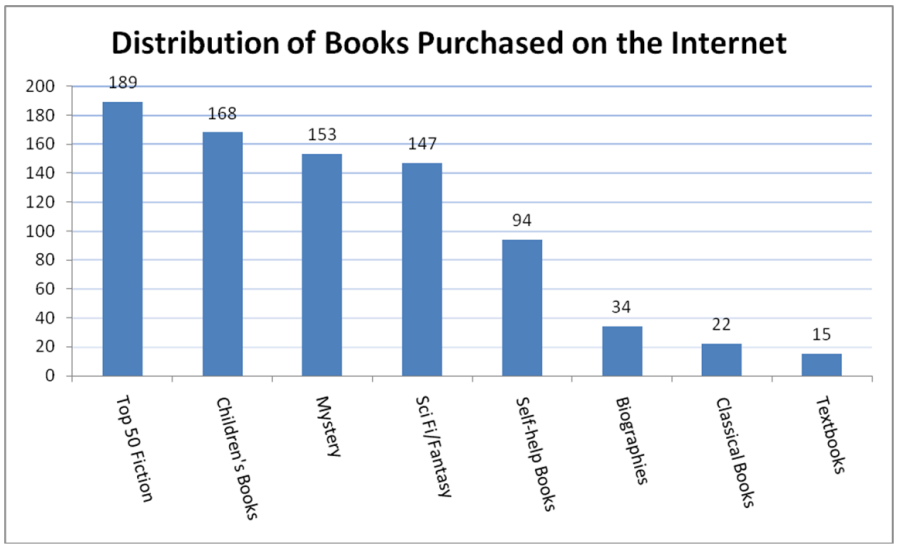


type:

What percentage of the books purchased were self-help books?

A. 11.44%
B. .1144%
C. 1.82%
D. 0.0182%
E. 0.940%

69. 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:

What percentages of books were in the top two categories?

A. 22.99
B. 20.44
C. 4.50
D. 43.43
E. .4343

70. Using the following data, describe the shape of the 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

distribution.

A. Skewed to the left
B. Bi-model
C. Normal
D. Skewed to the right

71. Using the following data, what would be the range of the values of the stem in a stem and leaf display?

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. 11-17
B. 11-18
C. 10-18
D. 12-17
E. 12-18

72. Using the following data, what would be the leaf unit in a stem and leaf display?

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. 1.0
B. 10
C. .10
D. .01
E. .20

73. Consider the following data on distances traveled by people to visit the local amusement park and calculate the relative frequency for the shortest distance.

Distance	Frequency
1-8 miles	15
9-16 miles	12
17-24 miles	7
25-32 miles	5
33-40 miles	1

A. .375
B. .150
C. .500
D. .300
E. .333

74. Consider the following data on distances traveled by people to visit the local amusement park and calculate the relative frequency for the distances over 24 miles.

Distance	Frequency
1-8 miles	15
9-16 miles	12
17-24 miles	7
25-32 miles	5
33-40 miles	1

A. .375
B. .150
C. .125
D. .025
E. .325

75. The following is a partial relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	
C	.18
D	.17
F	.06

Find the relative frequency for B grade
A. .78
B. .27
C. .65
D. .37
E. .47

76. The following is a relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	.37
C	.18
D	.17
F	.06

If this was the distribution of 200 students, find the frequency for the highest two grades:
A. 44
B. 118
C. 59
D. 74
E. 35

77. The following is a relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	.37
C	.18
D	.17
F	.06

If this was the distribution of 200 students, find the frequency of failures:
A. 12
B. 6
C. 23
D. 46
E. 3

78. The following is a relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	.37
C	.18
D	.17
F	.06

If we wish to depict these data using a pie chart, find how many degrees should be assigned to the highest grade of A.
A. 61.1
B. 22.0
C. 79.2
D. 90.0
E. 212.40

79. Recently an advertising company called 200 people and asked to identify the company that was in an ad running nationwide. The following results were obtained:

	Female	Male	Total
Correctly recalled the company	66	50	116
Incorrectly recalled the company	44	40	84
Total	110	90	200

What percentage of those surveyed were female and could not recall the company?
A. 40.0%
B. 22.0%
C. 52.4%
D. 66.7%
E. 37.9%

80. Recently an advertising company called 200 people and asked to identify the company that was in an ad running nationwide. The following results were obtained:

	Female	Male	Total
Correctly recalled the company	66	50	116
Incorrectly recalled the company	44	40	84
Total	110	90	200

What percentage of those surveyed could not correctly recall the company?
A. 58.00%
B. 56.89%
C. 55.00%
D. 43.10%
E. 42.00%

81. The local electronics retailer has recently conducted a study on purchasers of large screen televisions. The study recorded the type of television and the credit account balance of the customer at the time of purchase. The following results were obtained:

	Standard TV	LCD	Plasma	Projection
Under $200	10	16	40	5
$200-$800	8	12	24	15
Over $800	16	12	16	30
Total	34	40	80	50

What percentage of purchases were Plasma televisions by customers with the smallest credit balances?

A. 50.00%
B. 39.20%
C. 56.30%
D. 34.80%
E. 19.6%

82. The local electronics retailer has recently conducted a study on purchasers of large screen televisions. The study recorded the type of television and the credit account balance of the customer at the time of purchase. The following results were obtained:

	Standard TV	LCD	Plasma	Projection
Under $200	10	16	40	5
$200-$800	8	12	24	15
Over $800	16	12	16	30
Total	34	40	80	50

What percentage of the customers with the highest credit balances purchased an LCD television?
A. 36.3%
B. 5.9%
C. 19.6%
D. 56.3%
E. 16.2%

83. The number of weekly sales calls by a sample of 25 pharmaceutical salespersons is below:
24, 56, 43, 35, 37, 27, 29, 44, 34, 28, 33, 28, 46,31, 38, 41, 48, 38, 27, 29, 37, 33, 31, 40, 50
How many classes should be used in the construction of a histogram?
A. 4
B. 6
C. 10
D. 5
E. 2

84. The number of weekly sales calls by a sample of 25 pharmaceutical salespersons is below:
24, 56, 43, 35, 37, 27, 29, 44, 34, 28, 33, 28, 46,31, 38, 41, 48, 38, 27, 29, 37, 33, 31, 40, 50
What is the shape of the distribution of the data?
A. Skewed with tail to the right
B. Skewed with tail to the left
C. Normal
D. Bi-model

85. The number of items rejected daily by a manufacturer because of defects for the last 30 days are: 20, 21, 8, 17, 22, 19, 18, 19, 14, 17, 11, 6, 21, 25, 4, 19, 9, 12, 16, 16, 10, 28, 24, 6, 21, 20, 25, 5, 17, 8
How many classes should be used in the construction of a histogram?
A. 6
B. 5
C. 7
D. 4
E. 8

86. The number of weekly sales calls by a sample of 25 pharmaceutical salespersons is below:
24, 56, 43, 35, 37, 27, 29, 44, 34, 28, 33, 28, 46,31, 38, 41, 48, 38, 27, 29, 37, 33, 31, 40, 50
Construct an Ogive plot.

87. The number of items rejected daily by a manufacturer because of defects for the last 30 days are:
20, 21, 8, 17, 22, 19, 18, 19, 14, 17, 11, 6, 21, 25, 4, 19, 9, 12, 16, 16, 10, 28, 24, 6, 21, 20, 25, 5, 17, 8

Complete this frequency table for these data

	Frequency	Rel Freq	Cum Freq
4 < 9			
9 < 14			
14 < 19			
19 < 24			
24 < 29			

88. The number of items rejected daily by a manufacturer because of defects for the last 30 days are:
20, 21, 8, 17, 22, 19, 18, 19, 14, 17, 11, 6, 21, 25, 4, 19, 9, 12, 16, 16, 10, 28, 24, 6, 21, 20, 25, 5, 17, 8
Construct a stem-and-leaf plot.

89. The number of items rejected daily by a manufacturer because of defects for the last 30 days are:
20, 21, 8, 17, 22, 19, 18, 19, 14, 17, 11, 6, 21, 25, 4, 19, 9, 12, 16, 16, 10, 28, 24, 6, 21, 20, 25, 5, 17, 8
Construct an Ogive plot.

90.

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.

91. Consider the following data on distances traveled by people to visit the local amusement park.

Distance	Frequency
1-8 miles	15
9-16 miles	12
17-24 miles	7
25-32 miles	5
33-40 miles	1

Construct an Ogive plot that corresponds to the frequency table.

92. The following is a relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	.37
C	.18
D	.17
F	.06

If this was the distribution of 200 students, give the frequency distribution for this data:

93. The following is a relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	.37
C	.18
D	.17
F	.06

Construct a percent frequency bar chart for this data.

94. The following is a relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	.37
C	.18
D	.17
F	.06

If we wish to depict these data using a pie chart, find how many degrees (out of 360 degrees) should be assigned to each grade.

95. Fill in the missing components of the following frequency distribution constructed for a sample size of 50.

Class	Frequency	Rel Frequency	Cum Rel Freq
____ < 7.95			0.12
___ < 8.05			0.48
8.05 < _____		0.24	
___ <8.25		0.10	
8.25 < _____			

96. Recently an advertising company called 200 people and asked to identify the company that was in an ad running nationwide. The following results were obtained:

	Female	Male	Total
Correctly recalled the company	66	50	116
Incorrectly recalled the company	44	40	84
Total	110	90	200

Construct a table of row percentages.

97. Recently an advertising company called 200 people and asked to identify the company that was in an ad running nationwide. The following results were obtained:

	Female	Male	Total
Correctly recalled the company	66	50	116
Incorrectly recalled the company	44	40	84
Total	110	90	200

Construct a table of column percentages.

98. The local electronics retailer has recently conducted a study on purchasers of large screen televisions. The study recorded the type of television and the credit account balance of the customer at the time of purchase. The following results were obtained:

	Standard TV	LCD	Plasma	Projection
Under $200	10	16	40	5
$200-$800	8	12	24	15
Over $800	16	12	16	30
Total	34	40	80	50

Construct a table of row percentages.

99. The local electronics retailer has recently conducted a study on purchasers of large screen televisions. The study recorded the type of television and the credit account balance of the customer at the time of purchase. The following results were obtained:

	Standard TV	LCD	Plasma	Projection
Under $200	10	16	40	5
$200-$800	8	12	24	15
Over $800	16	12	16	30
Total	34	40	80	50

Construct a table of column percentages.

100. Math test anxiety can be found throughout the general population. A study of 116 seniors at a local high school was conducted. The following table was produced from the data. Complete the missing parts.

Score Range	Frequency	Rel Frequency	Cum Freq Dist
Very anxious 37-50		0.19	
Anxious/tense 33-36	8		0.26
Some mild anxiety 27-32			
Generally relaxed 20-26	24		0.67
Very relaxed 10-19		0.33	

101. The number of weekly sales calls by a sample of 25 pharmaceutical salespersons is below: 24, 56, 43, 35, 37, 27, 29, 44, 34, 28, 33, 28, 46,31, 38, 41, 48, 38, 27, 29, 37, 33, 31, 40, 50 Construct a histogram.

102. The number of weekly sales calls by a sample of 25 pharmaceutical salespersons is below: 24, 56, 43, 35, 37, 27, 29, 44, 34, 28, 33, 28, 46,31, 38, 41, 48, 38, 27, 29, 37, 33, 31, 40, 50 Construct a stem-and-leaf plot.

103. The number of weekly sales calls by a sample of 25 pharmaceutical salespersons is below: 24, 56, 43, 35, 37, 27, 29, 44, 34, 28, 33, 28, 46,31, 38, 41, 48, 38, 27, 29, 37, 33, 31, 40, 50 Construct a frequency polygon.

104. The following table lists the types of customer complaint calls on satellite service during the first two months after installation. Construct a Pareto chart.

No signal detected	20%
Can't receive local channels	14%
Missing channels	21%
Intermittent reception	8%
Remote control problems	25%
Other issues	12%

105. The following data consist of the number of sick days taken by the 100 employees at a small manufacturing company for the past eighteen months. Construct a dot plot of these data and describe the distribution. 5, 1, 4, 8, 0, 6, 3, 5, 3, 4, 7, 15, 5, 8, 2, 1, 5, 4

106. City hotel room rates were collected for 18 U.S. cities with the data below: Construct a stem-and-leaf diagram using the last digit as the leaf.

Hotel Room Rate by City	
Cincinnati	137
Columbus	144
Miami	145
Orlando	101
Tampa	120
Philadelphia	137
Chicago	169
San Francisco	179
Dallas	155
Detroit	140
Boston	207
Atlanta	201
Los Angeles	190
Portland, OR	165
Seattle	189
Minneapolis	153
Buffalo	115
Hartford, CT	125

107.

Hotel Room Rate by City	
Cincinnati	137
Columbus	144
Miami	145
Orlando	101
Tampa	120
Philadelphia	137
Chicago	169
San Francisco	179
Dallas	155
Detroit	140
Boston	207
Atlanta	201
Los Angeles	190
Portland, OR	165
Seattle	189
Minneapolis	153
Buffalo	115
Hartford, CT	125

City hotel room rates were collected for 18 U.S. cities with the data below:
How many classes should be made for a frequency distribution (histogram)? What would be the class width?

108.

Hotel Room Rate by City	
Cincinnati	137
Columbus	144
Miami	145
Orlando	101
Tampa	120
Philadelphia	137
Chicago	169
San Francisco	179
Dallas	155
Detroit	140
Boston	207
Atlanta	201
Los Angeles	190
Portland, OR	165
Seattle	189
Minneapolis	153
Buffalo	115
Hartford, CT	125

City hotel room rates were collected for 18 U.S. cities with the data below:
Create the frequency distribution table for constructing a histogram.

109.

Hotel Room Rate by City	
Cincinnati	137
Columbus	144
Miami	145
Orlando	101
Tampa	120
Philadelphia	137
Chicago	169
San Francisco	179
Dallas	155
Detroit	140
Boston	207
Atlanta	201
Los Angeles	190
Portland, OR	165
Seattle	189
Minneapolis	153
Buffalo	115
Hartford, CT	125

City hotel room rates were collected for 18 U.S. cities with the data below: Construct a relative frequency table.

110.

Hotel Room Rate by City	
Cincinnati	137
Columbus	144
Miami	145
Orlando	101
Tampa	120
Philadelphia	137
Chicago	169
San Francisco	179
Dallas	155
Detroit	140
Boston	207
Atlanta	201
Los Angeles	190
Portland, OR	165
Seattle	189
Minneapolis	153
Buffalo	115
Hartford, CT	125

City hotel room rates were collected for 18 U.S. cities with the data below: Construct a frequency histogram.

111. The local appliance store recently summarized their monthly sales by appliance type and by gender of the customer in the following table:

	Male	Female	Total
HD TV	52	28	80
Desktop Computer	30	30	60
Kitchen Appliances	10	45	55
Game Consoles	32	8	40
DVD Player	20	15	35
TOTAL	144	126	270

Construct a table of row percentages

112. The local appliance store recently summarized their monthly sales by appliance type and by gender of the customer in the following table:

	Male	Female	Total
HD TV	52	28	80
Desktop Computer	30	30	60
Kitchen Appliances	10	45	55
Game Consoles	32	8	40
DVD Player	20	15	35
TOTAL	144	126	270

Construct a table of column percentages

113.

Hotel Room Rate by City	
Cincinnati	137
Columbus	144
Miami	145
Orlando	101
Tampa	120
Philadelphia	137
Chicago	169
San Francisco	179
Dallas	155
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Boston	207
Atlanta	201
Los Angeles	190
Portland, OR	165
Seattle	189
Minneapolis	153
Buffalo	115
Hartford, CT	125

City hotel room rates were collected for 18 U.S. cities with the data below: Construct an ogive chart.

114. The HR manager of a major office supply chain is interested in determining whether an employee's educational level has an effect on knowledge of their job. An exam was given to 120 employees. The results are below:

	Score on Exam			
	High	Average	Low	Total
Bachelor's	4	20	11	35
Associate's	12	18	15	45
HS Diploma	9	22	9	40
Total	25	60	35	120

Calculate the table of row percentages.

115. The HR manager of a major office supply chain is interested in determining whether an employee's educational level has an effect on knowledge of their job. An exam was given to 120 employees. The results are below:

	Score on Exam			
	High	Average	Low	Total
Bachelor's	4	20	11	35
Associate's	12	18	15	45
HS Diploma	9	22	9	40
Total	25	60	35	120

Calculate the table of column percentages.

116. A human resource manager is interested in whether absences occur during the week with equal frequency. The manager took a random sample of 100 absences and created the following table:

Monday	28
Tuesday	20
Wednesday	12
Thursday	18
Friday	22

Construct a bar chart to display the distribution of number of absences by the day of the week

117. The following frequency table summarizes the ages of 60 shoppers at the local grocery store.

Age of Shopper	Frequency
Less than 24	10
24-32	21
33-41	10
42-50	8
51-59	5
Greater than 59	6

Construct a pie chart showing the distribution of shoppers' ages.

118. The manufacturer of a light fixture believes that the dollars spent on advertising, the price of the fixture and the number of retail stores selling the fixture in a particular month influence the light fixture sales. The manufacturer randomly selects 10 months and collects the following data:

Sales	Advertising	Price	# of stores
41	20	40	1
42	40	60	3
59	40	20	4
60	50	80	5
81	50	10	6
80	60	40	6
100	70	20	7
82	70	60	8
101	80	30	9
110	90	40	10

The sales are in thousands of units per month, the advertising is given in hundreds of dollars per month, the price is the unit retail price for the particular month. Construct a scatter plot of sales (y) by advertising expenditures (x) and interpret what the plot says.

119. The manufacturer of a light fixture believes that the dollars spent on advertising, the price of the fixture and the number of retail stores selling the fixture in a particular month influence the light fixture sales. The manufacturer randomly selects 10 months and collects the following data:

Sales	Advertising	Price	# of stores
41	20	40	1
42	40	60	3
59	40	20	4
60	50	80	5
81	50	10	6
80	60	40	6
100	70	20	7
82	70	60	8
101	80	30	9
110	90	40	10

The sales are in thousands of units per month, the advertising is given in hundreds of dollars per month, the price is the unit retail price for the particular month. Construct a scatter plot of sales (y) by price of the fixture (x) and interpret what the plot says.

120. The distance traveled by buses (in thousands) before the first major motor failure is distributed below with frequency and relative frequency for 191 buses. Complete the table.

Distance	Frequency	Relative Freq
< 40	17	
40-79		0.215
80-119	80	0.419
120-159	49	
Greater than 159		0.021

121. The manufacturer randomly selects 10 months and collects the following data:

Sales	Advertising	Price	# of stores
41	20	40	1
42	40	60	3
59	40	20	4
60	50	80	5
81	50	10	6
80	60	40	6
100	70	20	7
82	70	60	8
101	80	30	9
110	90	40	10

The sales are in thousands of units per month, the advertising is given in hundreds of dollars per month, the price is the unit retail price for the particular month. Construct a scatter plot of sales (y) by the number of stores selling the fixture for a given month (x) and interpret what the plot says.

ch02 Key

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

37. B

38. C

39. E

40. D

41. C

42. B

43. B

44. C

45. C

46. A

47. D

48. E

49. A

50. D

51. D

52. D

53. C

54. C

55. B

56. C

57. A

58. D

59. B

60. D

61. A

62. C

63. C

64. D

65. D

66. C

67. B

68. A

69. D

70. D

71. B

72. C

73. A

74. B

75. D

76. B

77. A

78. C

79. B

80. E

81. E

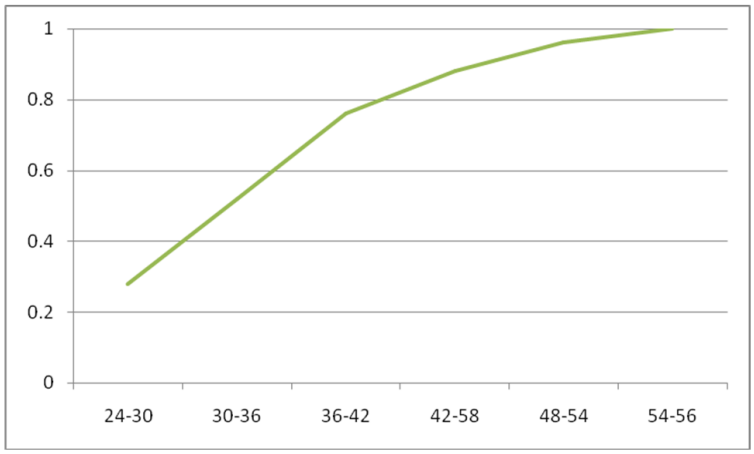
82. E

83. D

84. A

85. B

86.



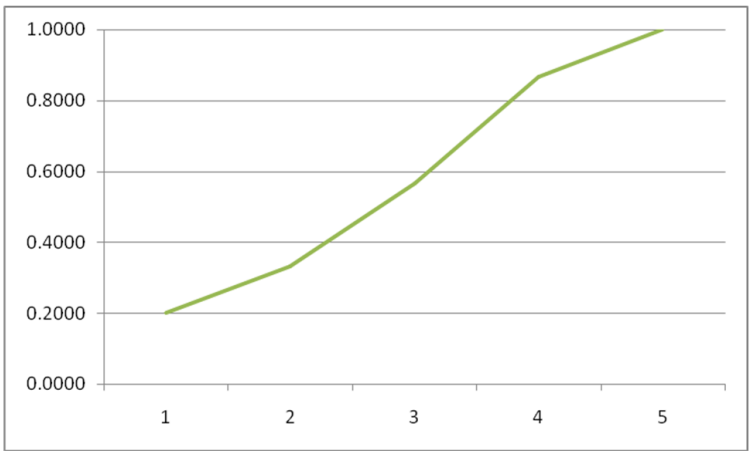
87.

	Frequency	Rel Freq	Cum Freq
4 < 9	6	.2	.2
9 < 14	4	.133	.333
14 < 19	7	.233	.5607
19 < 24	9	.30	.8607
24 < 29	4	.133	1.00

Stem-and-leaf of Rejected Items N = 30
Leaf Unit = 1.0

2 0 45
4 0 66
7 0 889
8 1 1
9 1 2
10 1 4
14 1 6777
(4) 1 8999
12 2 000111
6 2 2
5 2 455
2 2 6
1 2 9

88. Minitab output: (Number of stems should be at least 5 so a three-stem plot is not appropriate - need to do some form of split stem plot)

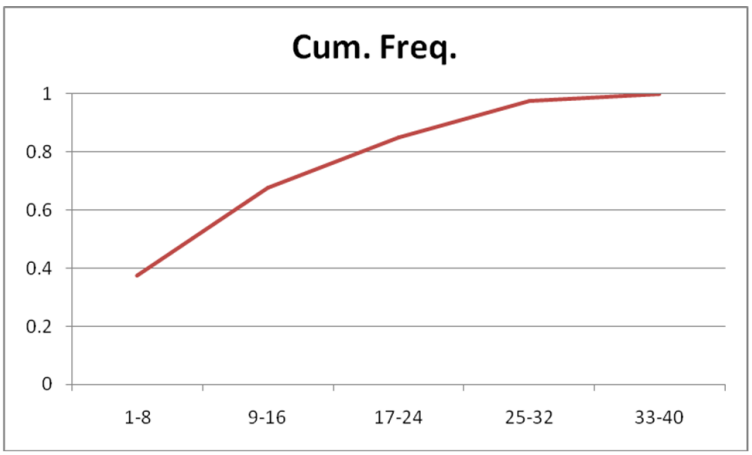


	Frequency	Rel Freq	Cum Freq
4 < 9	6	.2	.2
9 < 14	4	.133	.333
14 < 19	7	.233	.5607
19 < 24	9	.30	.8607
24 < 29	4	.133	1.00

89. Ogive chart is a graphical display of cumulative relative frequency. Frequency distribution table is:

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

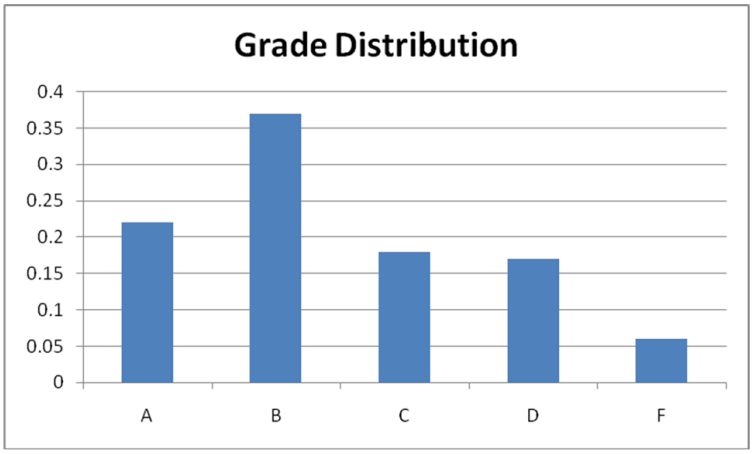
90. Stem and leaf of C1, N = 20 Leaf Unit = 0.10

91. 

92.

Grade	Frequency
A	44
B	74
C	36
D	34
F	12

93.



94.

Grade	Circle degrees
A	.22*360=79.2
B	.37*360=133.2
C	.18*360=64.8
D	.17*360=61.2
F	.06*360=21.6

95.

Class	Frequency	Rel Frequency	Cum Rel Freq
7.85 < 7.95	6	0.12	0.12
7.95 < 8.05	18	0.36	0.48
8.05 < 8.15	12	0.24	0.72
8.15 <8.25	5	0.10	0.82
8.25 < 8.35	9	0.18	1.00

96.

	Female	Male
Correctly recalled	66/116=0.569	50/116=0.431
Incorrectly recalled	44/84=0.524	40/84=0.476

97.

	Female	Male
Correctly recalled	66/110=0.6	50/90=0.556
Incorrectly recalled	44/110=0.4	40/90=0.444

98.

	Standard TV	LCD	Plasma	Projection
Under $200	10/71=0.141	16/71=0.225	40/71=0.563	5/71=0.070
$200-$800	8/59=0.136	12/59=0.203	24/59=0.407	15/59=0.254
Over $800	16/74=0.216	12/74=0.162	16/74=0.216	30/74=0.405

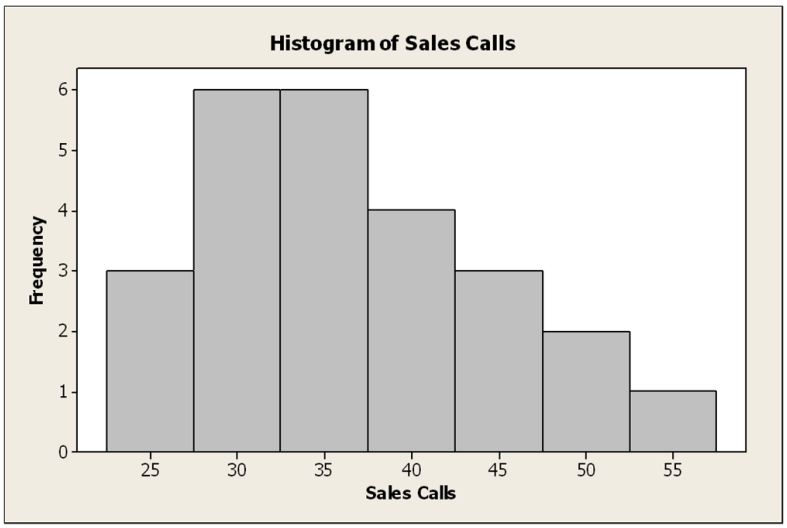
99.

	Standard TV	LCD	Plasma	Projection
Under $200	10/34=0.294	16/40=0.4	40/80=0.5	5/50=0.1
$200-$800	8/34=0.235	12/40=0.3	24/80=0.3	15/50=0.3
Over $800	16/34=0.471	12/40=0.3	16/80=0.2	30/50=0.6

100.

Score Range	Frequency	Rel Frequency	Cum Freq Dist
Very anxious 37-50	22	0.19	0.19
Anxious/tense 33-36	8	0.07	0.26
Some mild anxiety 27-32	24	0.207	0.467
Generally relaxed 20-26	24	0.207	0.674
Very relaxed 10-19	38	0.33	1.00

101.

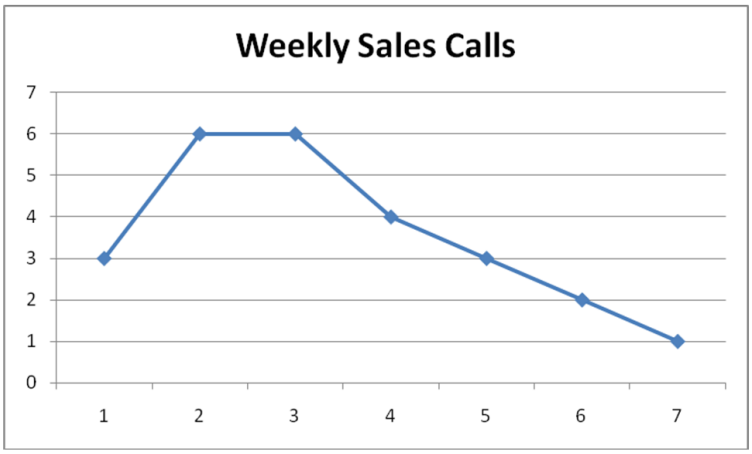


102.

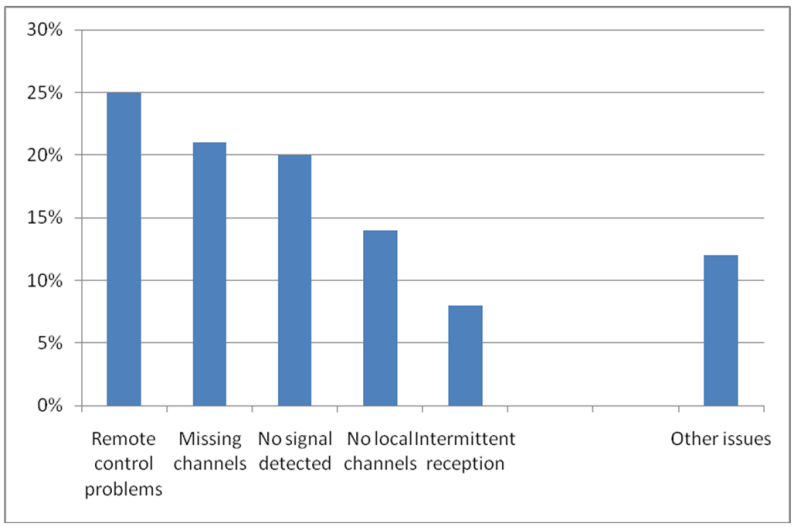
Stem-and-leaf of Sales Calls N = 25
Leaf Unit = 1.0

1	2	4
7	2	778899
12	3	11334
(5)	3	57788
8	4	0134
4	4	68
2	5	0
1	5	6

103.

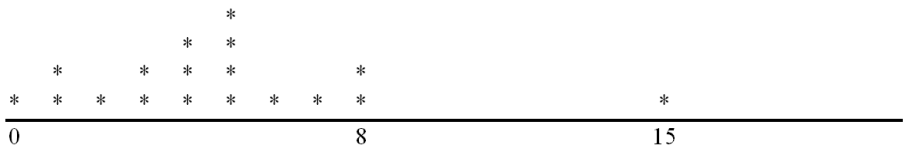


104.



Data are skewed to the right with one outlier. Over half of the data lie in the 4-5 day range.

105.



106.

Stem	Leaf
10	1
11	5
12	0,5
13	7,7
14	0,4,5
15	3,5
16	5,9
17	9
18	9
19	0
20	1,7

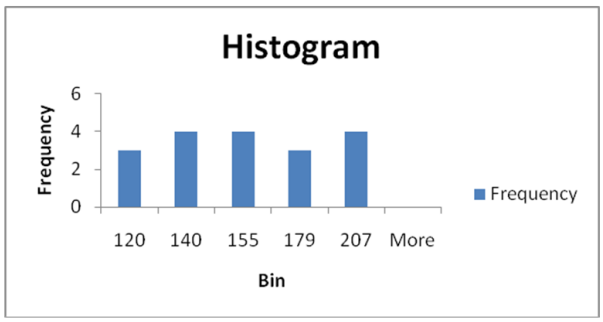
107. k = 5 Class length = (207-101)/5 = 106/5 = 21.2

Class #	Class	Frequency
1	101 and under 122	3
2	122 and under 143	4
3	143 and under 164	4
4	164 and under 185	3
5	186 - 207	4

108. k = 5 Class length = (207-101)/5 = 106/5 = 21.2 round to 21

Class #	Class	Frequency	Relative Freq
1	101 and under 122	3	.167
2	122 and under 143	4	.222
3	143 and under 164	4	.222
4	164 and under 185	3	.167
5	186 - 207	4	.222

109. k = 5 Class length = (207-101)/5 = 106/5 = 21.2



Class #	Class	Frequency	Relative Freq
1	101 and under 122	3	.167
2	122 and under 143	4	.222
3	143 and under 164	4	.222
4	164 and under 185	3	.167
5	186 - 207	4	.222

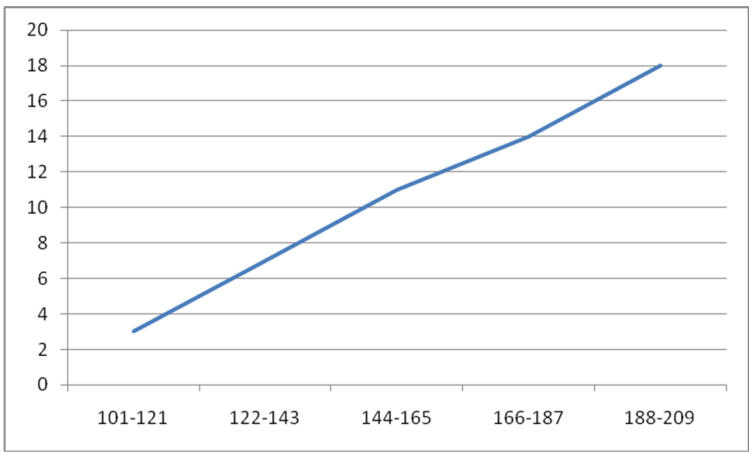
110. k = 5 Class length = (207-101)/5 = 106/5 = 21.2

111.

	Male	Female
HD TV	0.65	0.35
Desktop Computer	0.50	0.50
Kitchen Appliances	0.18	0.82
Game Consoles	0.80	0.20
DVD Player	0.57	0.43

112.

	Male	Female
HD TV	0.36	0.22
Desktop Computer	0.21	0.24
Kitchen Appliances	0.07	0.36
Game Consoles	0.22	0.06
DVD Player	0.14	0.12



Class #	Class	Frequency	Relative Freq
1	101 and under 122	3	.167
2	122 and under 143	4	.222
3	143 and under 164	4	.222
4	164 and under 185	3	.167
5	186 - 207	4	.222

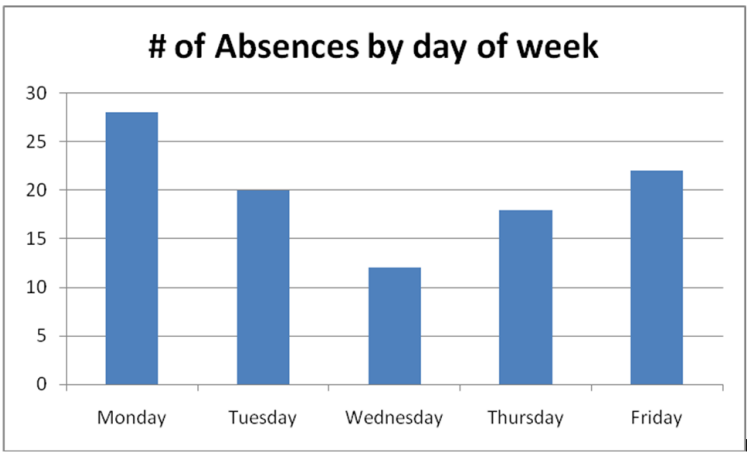
113. k = 5 Class length = (207-101)/5 = 106/5 = 21.2

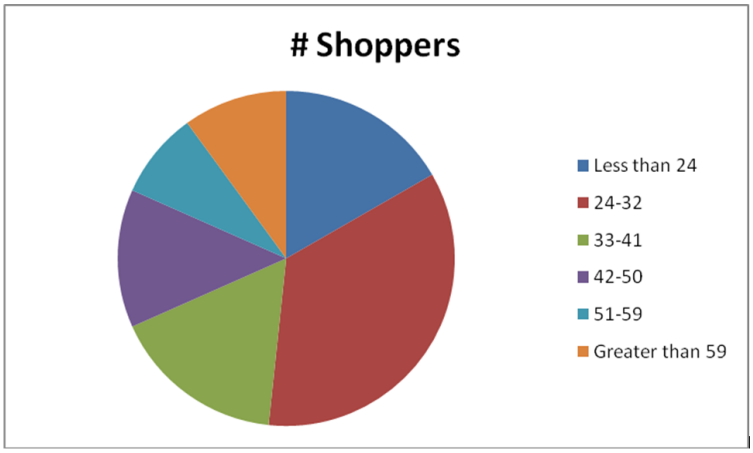
114.

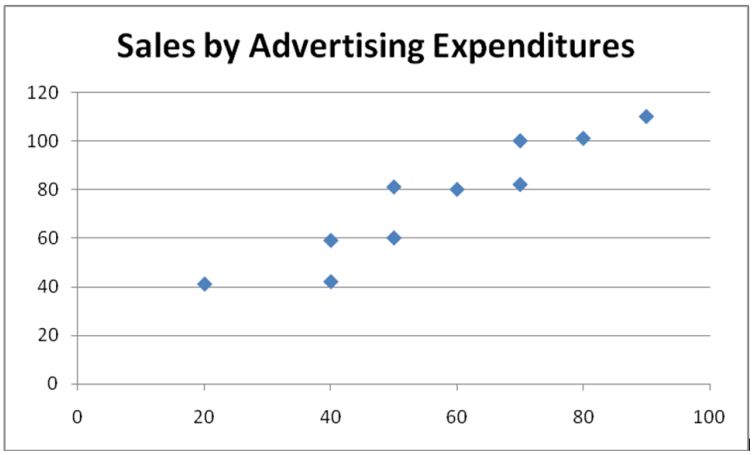
	Score on Exam			
	High	Average	Low	Total
Bachelor's	0.114	0.571	0.314	1
Associate's	0.267	0.400	0.333	1
HS Diploma	0.225	0.550	0.225	1

115.

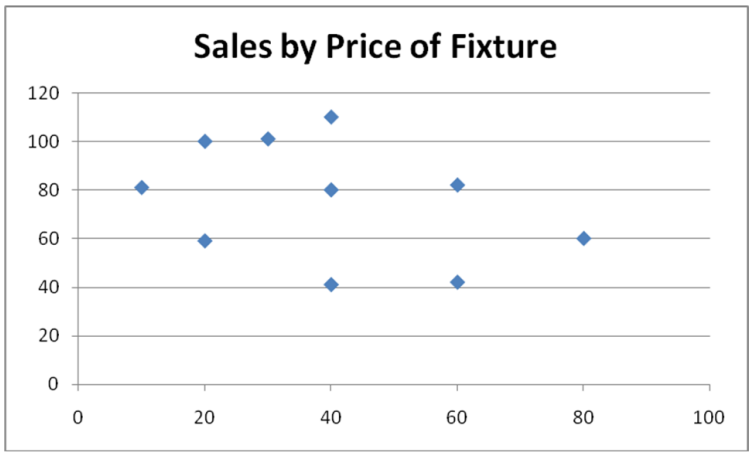
	Score on Exam		
	High	Average	Low
Bachelor's	0.160	0.333	0.314
Associate's	0.480	0.300	0.429
HS Diploma	0.360	0.367	0.257

116. 

117. 



118. Plot shows a positive linear relationship between sales and advertising, that is, as advertising expenditures increase, sales increase.



119. There does not appear to be a linear relationship between the sales and the price of the fixture.

120.

Distance	Frequency	Relative Freq
< 40	17	0.089
40-79	41	0.215
80-119	80	0.419
120-159	49	0.257
Greater than 159	4	0.021
	191	

121. The scatter plot shows a positive linear relationship between sales and the number of stores selling the fixture.

ch02 Summary

Category	*# of Questions*
AACSB: Analytic	70
AACSB: Reflective Thinking	51
Blooms: Analysis	1
Blooms: Application	70
Blooms: Comprehension	3
Blooms: Knowledge	47
Bowerman - Chapter 02	121
Difficulty: Easy	14
Difficulty: Hard	9
Difficulty: Medium	98
Learning Objective: 02-01 Summarize qualitative data by using frequency distributions; bar charts; and pie charts.	21
Learning Objective: 02-02 Construct and interpret Pareto charts (Optional).	6
Learning Objective: 02-03 Summarize quantitative data by using frequency distributions; histograms; frequency polygons; and ogives.	49
Learning Objective: 02-04 Construct and interpret dot plots.	3
Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.	19
Learning Objective: 02-06 Examine the relationships between variables by using cross-tabulation tables (Optional).	16
Learning Objective: 02-07 Examine the relationships between variables by using scatter plots (Optional).	7
Learning Objective: 02-08 Recognize misleading graphs and charts (Optional).	3
Topic: Bar Chart	1
Topic: Cross-tabulation	16
Topic: Dot Plot	2
Topic: Frequency Distribution	2
Topic: Frequency Polygon	1
Topic: Graph	1
Topic: Graphing Qualitative Data	16
Topic: Graphing Quantitative Data	10
Topic: Histogram	32
Topic: Misleading Graphs	3
Topic: Ogive chart	1
Topic: Pareto Chart	4
Topic: Qualitative Data	4
Topic: Scatter Plots	7
Topic: Stem And Leaf	19
Topic: Summarizing Quantitative Data	2