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 scatterplot 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. A(n) _____is a graph of a cumulative distribution.
    A. Histogram
    B. Scatter plot
    C. Ogive plot
    D. Pie Chart

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

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

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

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

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

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

18. 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

19. 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

20. 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

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

22. A _____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

23. _____ 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

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

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

26. 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

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

28. 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

29. 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

30. 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

31. 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

32. 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

33. 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

34. 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

35. 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

36. 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

37. 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

38. 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

39. 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

40. 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 peak
D. Skewed to the left
E. Skewed to the right

41. 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

42. 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

43. 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

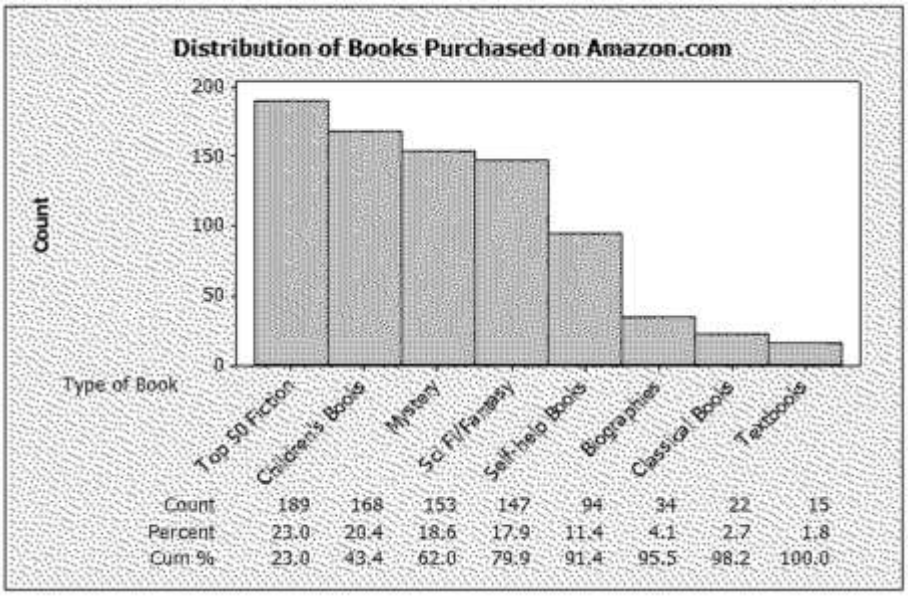
44. The 550 students answered an additional question with the following results based on their rating of their instructor:

	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

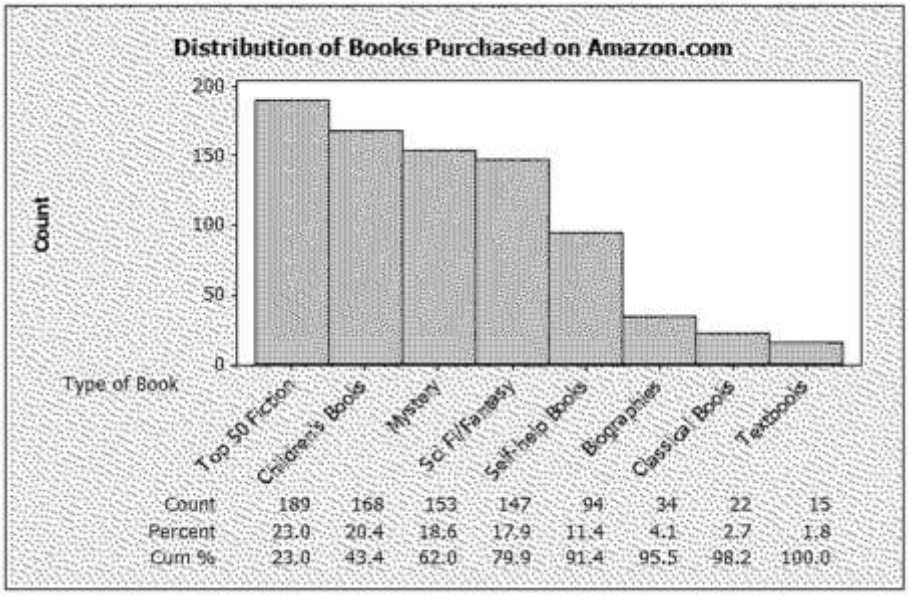
45. 822 customers were randomly selected from those who had recently bought a book over the internet. The chart below shows the breakdown of the classification of the book type:



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

46. 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

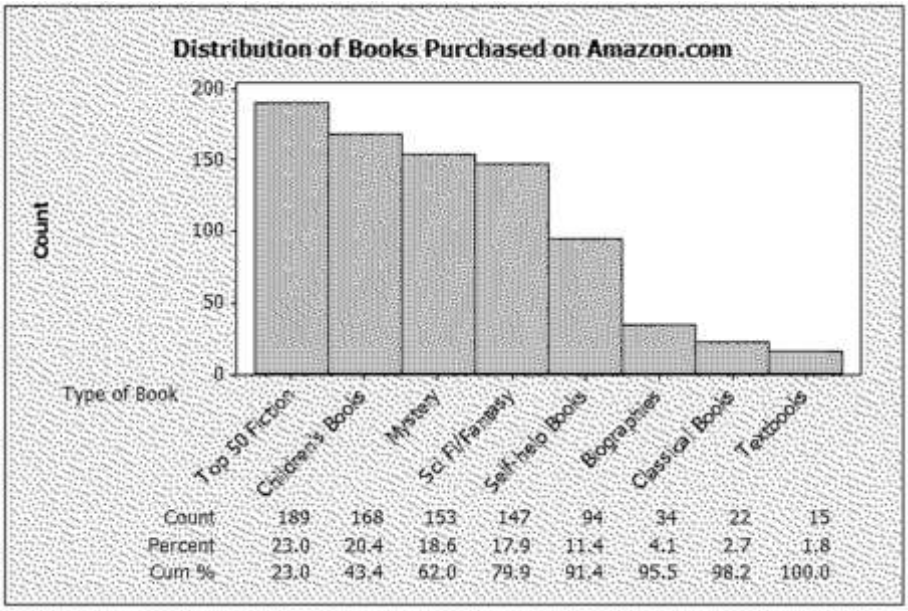


type:

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

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

47. 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 books were in the top two categories?

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

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

_____

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

_____

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

_____

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

_____

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

_____

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

_____

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

_____

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

_____

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

_____

57. A _____ can be used to differential the "vital few" causes of quality problems from the "trival many" causes of quality problems.

_____

58. A _____ is a graph of cumulative distribution.

_____

59.

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:
(a) Create a stem and leaf display for the sample.
(b) Describe the shape of the stem and leaf display.

60. 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

Calculate the relative frequency table

61. 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 olgive plot that corresponds to the frequency table.

62. 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

63. 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:

64. 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.

65. 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.

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

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

67. 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?

68. 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?

69. 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

70. 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

71. 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?

72. 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?

73. 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.

74. 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: Construct a table of column percentages.

	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

75. Math test anxiety can be found throughout the general population. A study of 116 seniors at a local high sch[illegible] 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	

76. 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?

77. 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

78. 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.

79. 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 Ogive plot

80. 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?

81. 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,

Complete this frequency table for these data

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

82. 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.

83. 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 Ogive plot

ch02 Key

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

37. E

38. A

39. D

40. D

41. D

42. C

43. D

44. C

45. B

46. A

47. D

48. Bar Chart

49. Defect

50. Histogram

51. Frequency

52. Skewed

53. Relative frequency

54. Right

55. Left

56. Bar chart

57. Pareto chart

58. Ogive plot

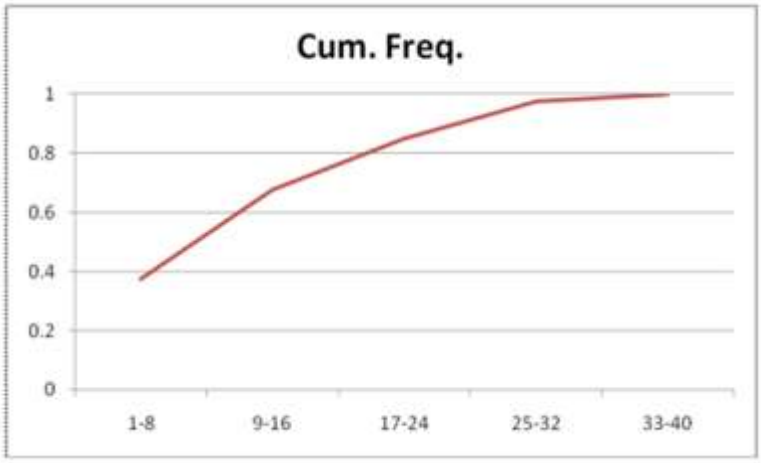
(b) Single peaked, skewed right

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

59. (a) Stem and leaf of C_1, N=20 Leaf Unit=0.10

60.

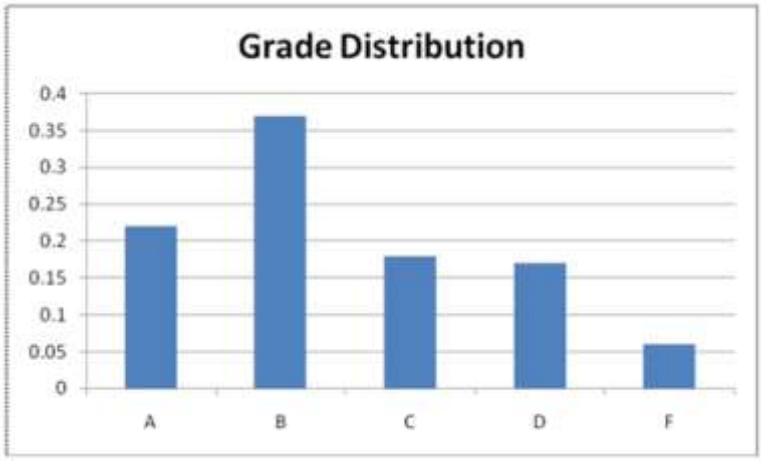
Distance	Relative Frequency
1-8 miles	.375
9-16 miles	.3
17-24 miles	.175
25-32 miles	.125
33-40 miles	.025

61. 

62. .37

63.

Grade	Frequency
A	44
B	74
C	36
D	34
F	6

64. 

65.

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

66.

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

67. 44/200=0.22

68. 116/200=0.58

69.

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

70.

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

71. 40/204=0.196

72. 12/204=0.059

73.

	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

74.

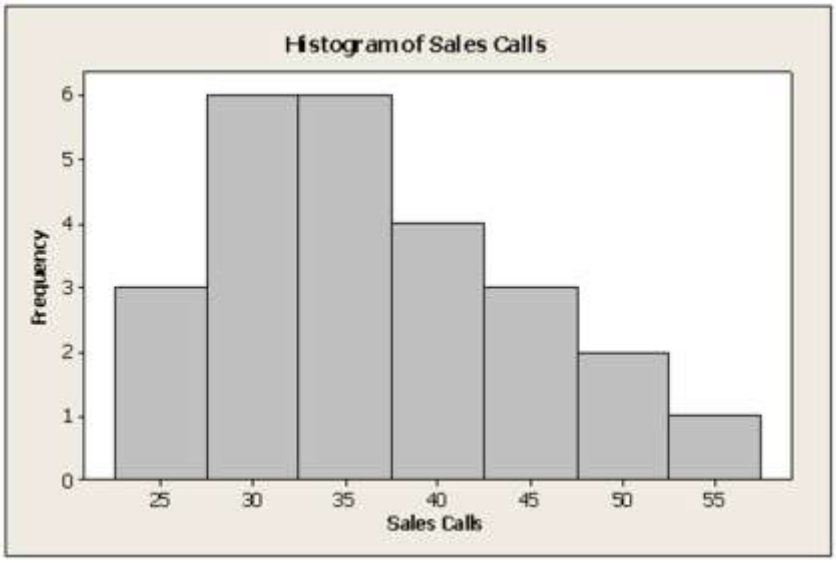
	Standard TV	LCD	Plasma	Projection
Under $200	10/34=0.294	16/40=0.4	40/80=0.5	5.50=0.1
$200-$800	8/34=0.235	12/40=0.3	24/80=0.3	15/50=0.3
Over $800	16/34=0.471	12/40=0.3	16/80=0.2	30/50=0.6

75.

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

76. 5

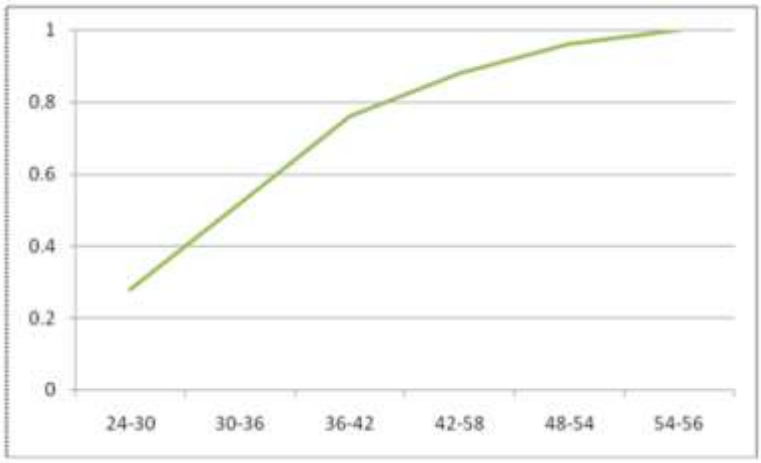
77.



78.

```
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
```

79. 

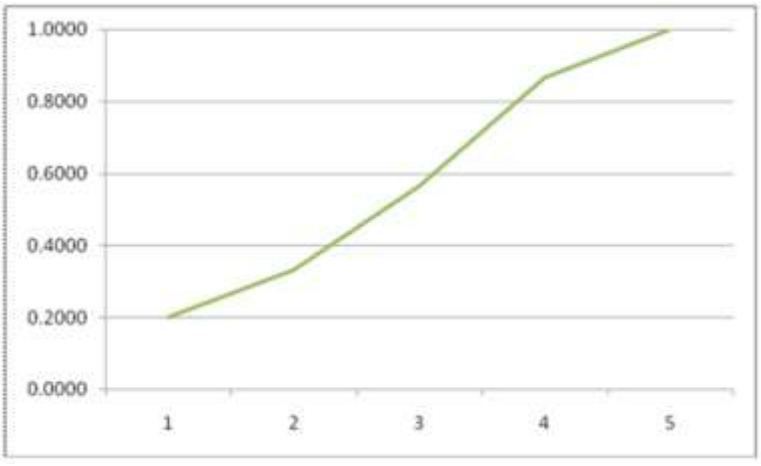
80. 5

81.

	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

82.
```
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
```

83. 

ch02 Summary

Category	*# of Questions*
AACSB: Analytic Skills	43
AACSB: Reflective thinking skills	40
Bowerman - Chapter 02	83
Difficulty: Easy	10
Difficulty: Hard	9
Difficulty: Medium	64