SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question. Provide an appropriate response. Round relative frequencies to thousandths.

1) Scott Tarnowski owns a pet grooming shop. His prices for grooming dogs are based on the size of the dog. His records from last year are summarized below. Construct a frequency distribution and a relative frequency distribution. Show the percentage represented by each relative frequency. 1) _____

Class	Frequency
Large	345
Medium	830
Small	645

2) The results of a survey about a recent judicial appointment are given in the table below. Construct a relative frequency distribution. 2) _____

Response	Frequency
Strongly Favor	25
Favor	26
Neutral	8
Oppose	22
Strongly Oppose	119

3) The preschool children at Elmwood Elementary School were asked to name their favorite color. The results are listed below. Construct a frequency distribution and a relative frequency distribution. 3) _____

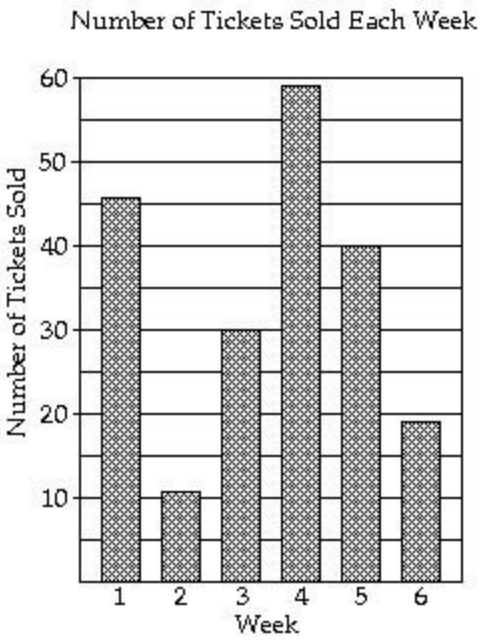
yellow	yellow	blue	purple	red
red	red	yellow	red	blue
red	blue	purple	purple	purple
blue	red	purple	red	green

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

4) True or False: The sum of all the relative frequencies of a distribution will always add up to 1. 4) _____
A) True B) False

5) True or False: Relative frequency is the proportion (or percent) of observations within a category and is found using the formula: relative frequency = $\frac{\text{frequency}}{\text{sum of all frequencies}}$. 5) _____
A) False B) True

The bar graph shows the number of tickets sold each week by the garden club for their annual flower show.



6) During which week was the most number of tickets sold? 6) _____

A) week 1 B) week 4 C) week 2 D) week 5

7) During which week was the fewest number of tickets sold? 7) _____

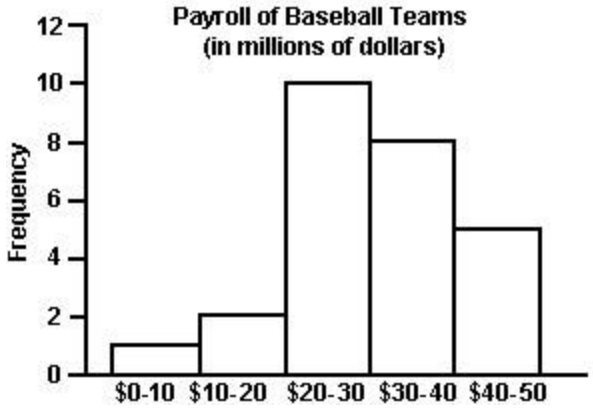
A) week 4 B) week 6 C) week 5 D) week 2

8) Approximately how many tickets were sold during week 5? 8) _____

A) 46 tickets B) 19 tickets C) 40 tickets D) 11 tickets

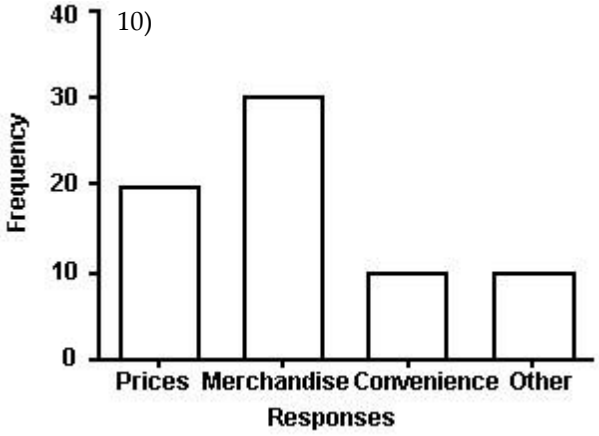
Provide an appropriate response.

9) The payroll amounts for 26 major-league baseball teams are shown below. Aprroximately what percentage of the payrolls were in the $30- $40 million range? Round to the nearest whole percent. 9) _____



A) 19% B) 31% C) 42% D) 8%

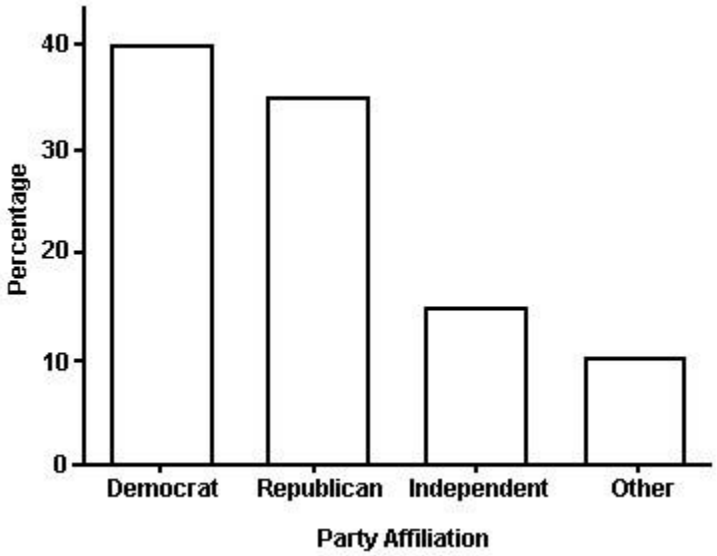
10) Retailers are always interested in determining why a customer selected their store to make a purchase. A sporting goods retailer conducted a customer survey to determine why its customers shopped at the store. The results are shown below. What percentage of the customers responded that the merchandise was the reason they shopped at the store? Round to the nearest whole percent

10) 

___
___

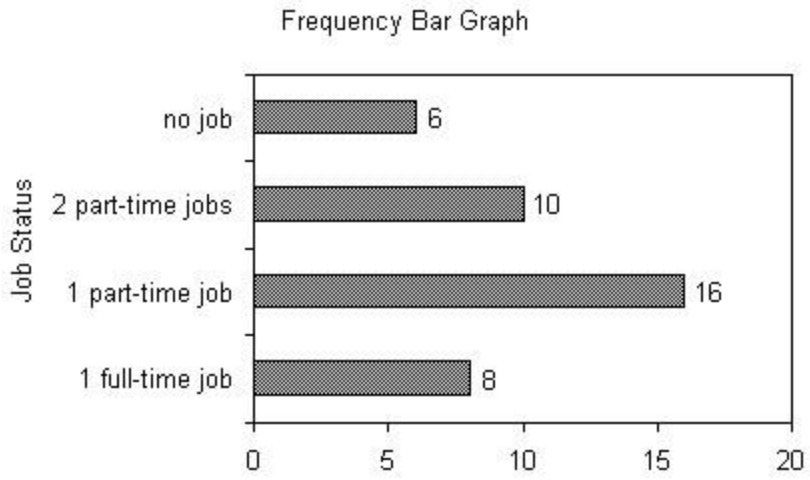
A) 43% B) 30% C) 29% D) 50%

11) The bar graph below shows the political party affiliation of 1000 registered U.S. voters. What percentage of the 1000 registered U.S. voters belonged to one of the traditional two parties (Democratic and Republican)? 11) _____



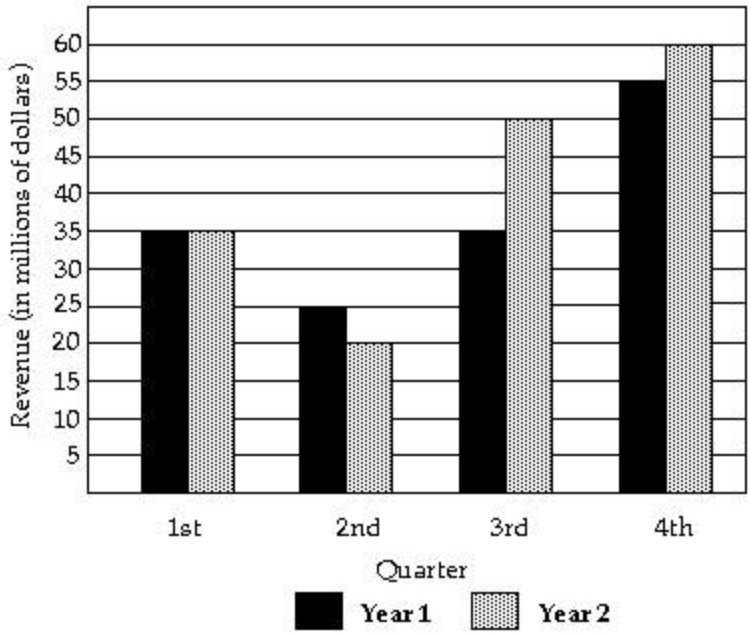
A) 35% B) 40% C) 25% D) 75%

12) The Excel frequency bar graph below describes the employment status of a random sample of U.S. adults. What is the percentage of those having no job? 12) _____



A) 20%
B) 15%
C) 40%
D) cannot determine

The following double-bar graph illustrates the revenue for a company for the four quarters of the year for two different years. Use the graph to answer the question.



13) In what quarter was the revenue the greatest for Year 2? 13) _____
A) first quarter B) fourth quarter C) third quarter D) second quarter

14) In what quarter was the revenue the least for Year 2? 14) _____
A) third quarter B) fourth quarter C) second quarter D) first quarter

15) What was the revenue for the first quarter of Year 1? 15) _____
A) $7 million B) $4 million C) $35 million D) $20 million

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question. Provide an appropriate response.

16) The grade point averages for 40 evening students are listed below. Construct a frequency bar graph and a relative frequency bar graph. 16) _____

Grade Point Average	Frequency
0.5–0.9	4
1.0–1.4	2
1.5–1.9	7
2.0–2.4	9
2.5–2.9	2
3.0–3.4	10
3.5–3.9	2
4.0–4.4	4

17) The local police, using radar, checked the speeds (in mph) of 30 motorists in a construction area. The results are listed below. Construct a frequency bar graph and a relative frequency bar graph.

Speed	Frequency
33–35	3
36–38	6
39–41	6
42–44	6
45–47	3
48–50	6

17) ___
___
___
___
_

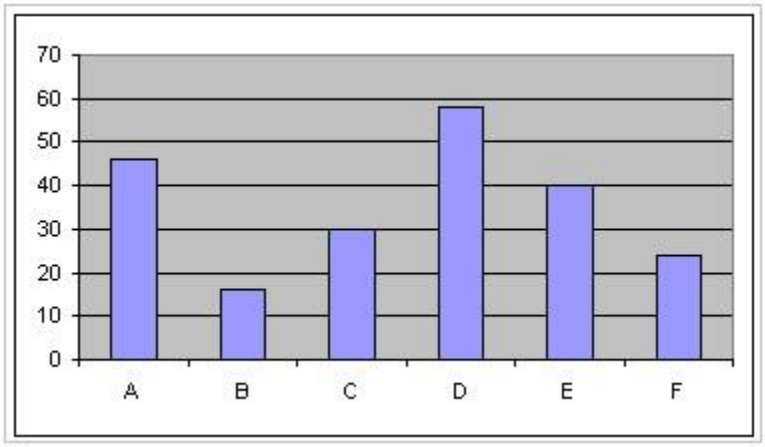
18) Listed below are the ACT scores of 40 randomly selected students at a major university. 18) _____

18	22	13	15	24	24	20	19	19	12
16	25	14	19	21	23	25	18	18	13
26	26	25	25	19	17	18	15	13	21
19	19	14	24	20	21	23	22	19	17

a) Construct a relative frequency bar graph of the data, using eight classes.
b) If the university wants to accept the top 90% of the applicants, what should the minimum score be?
c) If the university sets the minimum score at 17, what percent of the applicants will be accepted?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

19) Given the bar graph shown below, the Pareto chart that would best represent the data should have the bars in the following order. 19) _____



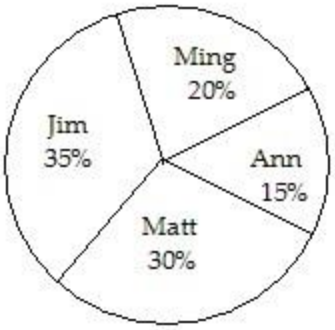
A) D A E C F B
B) C A D E F B
C) B F C E A D
D) B F E D A C

The pie chart shows the percentage of votes received by each candidate in the student council presidential election. Use the pie chart to answer the question.

20)

20) ___
___

Student Council President



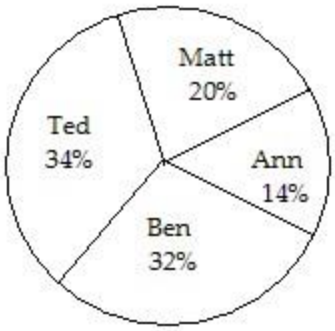
700 total votes

Who got the most votes?

A) Ann B) Matt C) Jim D) Ming

21) 21) _____

Student Council President



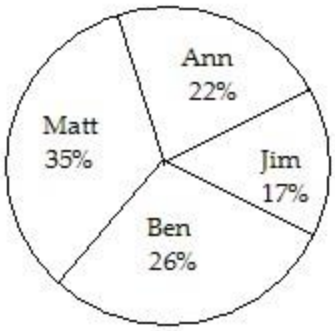
400 total votes

Who got the fewest votes?

A) Ben B) Ted C) Matt D) Ann

22) 22) _____

Student Council President



300 total votes

What percent of the votes did Jim and Ann receive together?

A) 39% B) 22% C) 17% D) 61%

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question. Construct a pie chart for the data. Label each category with its percentage.

23) A study was conducted to determine how people get jobs. Four hundred subjects were randomly selected and the results are listed below. Round percents to whole numbers. 23) _____

Job Sources of Survey Respondents	Frequency
Newspaper want ads	72
Online services	124
Executive search firms	69
Mailings	32
Networking	103

24) Scott Tarnowski owns a pet grooming shop. His prices for grooming dogs are based on the size of the dog. His records from last year are summarized below. Round percents to whole numbers. 24) _____

Class	Frequency
Large	345
Medium	830
Small	645

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. Provide an appropriate response.

25) A two-pound bag of assorted candy contained 100 caramels, 83 mint patties, 93 chocolate squares, 80 nut clusters, and 79 peanut butter taffy pieces. To create a pie chart of this data, the angle for the slice representing each candy type must be computed. What is the degree measure of the slice representing the mint patties rounded to the nearest degree? 25) _____

A) 52° B) 69° C) 19° D) 5°

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question. Construct a frequency distribution for the data.

26) A random sample of 30 high school students is selected. Each student is asked how much time he or she spent on the Internet during the previous week. The following times (in hours) are obtained: 26) _____

14	22	16	19	16	14	16	15	13	19
17	15	15	14	17	16	13	13	18	15
13	15	22	17	14	18	14	17	16	15

Construct a frequency distribution for the data.

27) A sample of 25 service project scores is taken and is recorded below. Construct a frequency distribution for this data. 27) _____

97	96	96	95	96
99	97	97	100	99
95	98	95	96	100
95	98	96	96	100
95	97	99	97	98

Construct the specified histogram.

28) A random sample of 30 high school students is selected. Each student is asked how much time he or she spent on the Internet during the previous week. The following tim (in hours) are es recorded:

6 28) ___
14 8 ___
11 8 ___
6 8 ___
7 5 _
11
9
7 7
6 9
8 5
5 10
7
5
7 14
9 6
10 6
9 8
7
Construct a frequency histogram for this data.

29) A sample of 25 community service projects is obtained and the scores are recorded. The results are shown below. Construct a frequency histogram for this data. 29) _____

97	96	96	95	96
99	97	97	100	99
95	98	95	96	100
95	98	96	96	100
95	97	99	97	98

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. Provide an appropriate response.

30) The class width is the difference between 30) _____

A) Two successive lower class limits
B) The largest frequency and the smallest frequency
C) The high and the low data values
D) The upper class limit and the lower class limit of a class

31) Determine the number of classes in the frequency table below. 31) _____

Class	Frequency
38–39	7
40–41	2
42–43	6
44–45	4
46–47	1

A) 20 B) 2 C) 6 D) 5

32) Find the class width for the frequency table below. 32) _____

Class	Frequency
31–32	3
33–34	1
35–36	3
37–38	6
39–40	2

A) 2.5 B) 2 C) 1.5 D) 1

33) Use the following frequency distribution to determine the class limits of the third class. 33) _____

Class	Frequency
9–11	7
12–14	11
15–17	8
18–20	5
21–23	9
24–26	6

A) lower limit: 15; upper limit: 17 B) lower limit: 15; upper limit: 18
C) lower limit: 14.5; upper limit: 17.5 D) lower limit: 14; upper limit: 18

34) A researcher records the number of employees of each of the IT companies in the town of Westmoore. The results are summarized in the table. 34) _____

Number of Employees	Number of IT Companies
0 – 749	30
750 – 1499	24
1500 – 2249	6
2250 – 2999	5
3000 – 3749	5

Find the class width.
A) 3749 B) 5 C) 749.5 D) 750

35) A researcher records the number of employees of each of the IT companies in the town of Westmoore. The results are summarized in the table. 35) _____

Number of Employees	Number of IT Companies
0 – 399	36
400 – 799	22
800 – 1199	9
1200 – 1599	6
1600 – 1999	7

Find the class limits of the third class.
A) lower limit: 799.5; upper limit: 1199.5 B) lower limit: 799; upper limit: 1200
C) lower limit: 800; upper limit: 1199 D) lower limit: 800; upper limit: 1200

36) The weights (in pounds) of babies born at St Mary's hospital last month are summarized in the table.

Weight (lb)	Number of Babies
5.0 – 5.8	7
5.9 – 6.7	18
6.8 – 7.6	20
7.7 – 8.5	10
8.6 – 9.4	5

36) Find the class width.

A) 0.8 lb B) 0.9 lb C) 0.85 lb D) 0.95 lb

37) The weights (in pounds) of babies born at St Mary's hospital last month are summarized in the table. 37) _____

Weight (lb)	Number of Babies
5.0 – 6	5
6.1 – 7.1	19
7.2 – 8.2	20
8.3 – 9.3	9
9.4 – 10.4	4

Find the class limits for the second class.

A) lower limit: 6.1; upper limit: 7.2 B) lower limit: 6.1; upper limit: 7.1
C) lower limit: 6.05; upper limit:7.15 D) lower limit: 6; upper limit: 7.2

38) The table below summarizes the weights of the almonds (in grams) in a one-pound bag. What is the class width? 38) _____

Weight (g)	Frequency
0.7585-0.8184	1
0.8185-0.8784	1
0.8785-0.9384	1
0.9385-0.9984	3
0.9985-1.0584	157
1.0585-1.1184	171
1.1185-1.1784	8

A) 0.4 B) 0.06 C) 0.408 D) 0.059

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question. Construct the requested frequency distribution.

39) The June precipitation amounts (in inches) for 40 cites are listed below. Construct a frequency distribution and a relative frequency distribution using eight classes. 39) _____

2.0	3.2	1.8	2.9	0.9	4.0	3.3	2.9	3.6	0.8
3.1	2.4	2.4	2.3	1.6	1.6	4.0	3.1	3.2	1.8
2.2	2.2	1.7	0.5	3.6	3.4	1.9	2.0	3.0	1.1
3.0	4.0	4.0	2.1	1.9	1.1	0.5	3.2	3.0	2.2

40) The commute times (in minutes) of 30 executives are listed below. Construct a frequency distribution and a relative frequency distribution using five classes. Round relative frequency values to three decimal places. 40)

70	72	71	70	69	73	69
67	71	70	74	69	68	71
69	71	68	67	73	74	70

_____ _____

41) The March utility bills (in dollars) of 30 homeowners are listed below. Construct a frequency distribution and a relative frequency distribution using six classes. 41) _____

44	38	41	50	36	36	43	42	49	48
35	40	37	41	43	50	45	45	39	38
50	41	47	36	35	40	42	43	48	33

Provide an appropriate response.

42) A sample of 15 Boy Scouts was selected and their weights (in pounds) were recorded as follows: 42) _____

97	120	137	124	117
108	134	126	123	106
130	110	100	120	140

a. Using a class width of 10, give the upper and lower limits for five classes, starting with a lower limit of 95 for the first class.

b. Construct a frequency distribution for the data

Construct the specified histogram.

43) For the data below, construct a frequency distribution and a relative frequency distribution. 43) _____

Height (in inches)	Frequency
50 – 52	5
53 – 55	8
56 – 58	12
59 – 61	13
62 – 64	11

44) For the data below, construct a frequency histogram and a relative frequency histogram. 44) _____

Weight (in pounds)	Frequency
135 – 139	6
140 – 144	4
145 – 149	11
150 – 154	15
155 – 159	8

45) The 30 students in Mrs Harrison's literature class were asked how many cousins they had. The results are shown below. Create a frequency histogram for the data using a class width of 2. 45) _____

10	1	3	5	4	7
5	1	0	9	11	1
5	4	1	7	7	11
0	6	6	1	5	7
10	1	1	5	6	0

46) The 30 students in Mrs Harrison's literature class were asked how many cousins they had. The results are shown below. Construct a relative-frequency histogram using a class width of 2. 46)

10	1	3	5	4	7
5	1	0	9	11	1
5	4	1	7	7	11
0	6	6	1	5	7

10
1
1
5
6
0

_____ _____

47) A sample of 15 Girl Scouts was selected and their weights (in pounds) were recorded. The results are listed below. Construct a frequency histogram for the data using a class width of 10 and using 95 as the lower limit of the first class. 47) _____

97	120	137	124	117
108	134	126	123	106
130	110	100	120	140

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. Provide an appropriate response.

48) What is the difference between a bar chart and a histogram? 48) _____

A) The bars in a bar chart are all the same width while the bars of a histogram may be of various widths.

B) The bars in a bar chart may be of various widths while the bars of a histogram are all the same width.

C) There is no difference between these two graphical displays.

D) The bars on a bar chart do not touch while the bars of a histogram do touch.

49) For the stem-and-leaf plot below, what are the maximum and minimum entries? 49) _____

1 | 0 5
1 | 6 6 6 7 8 9
2 | 0 1 1 2 3 4 4 5 6 6
2 | 7 7 7 8 8 9 9 9
3 | 0 1 1 2 3 4 4 5 5
3 | 6 6 6 7 8 8 9 9
4 | 0 9

A) max: 47; min: 15
B) max: 40; min: 10
C) max: 38; min: 7
D) max: 49; min: 10

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question. Determine the original set of data.

50) 50) _____

Stem	Leaves
7	2
8	2
9	0 9
10	0
11	5 8
12	6 9
13	6 7 9
14	2 3 8 9
15	5 9

Legend: 5 | 2 represents 52

51)

Stem	Leaves
5	9
6	2
7	0 5
8	6
9	0 3
10	6 9
11	6 7 9
12	2 3 8 9
13	9 9

Legend:
5| 9
represent
s 5.9

Construct a stem-and-leaf plot for the data.

52) The number of home runs that Mark McGwire hit in the first 13 years of his major league baseball career are listed below. (Source: Major League Handbook) Construct a stem-and-leaf plot for this data. 52) _____

3 49 32 33 39 22 42 9 9 39 52 58 70

53) The numbers of runs batted in by Mark McLemore in the first 13 years of his major league baseball career are listed below. (Source: Major League Handbook) Construct a stem-and-leaf plot for this data. 53) _____

0 102 56 25 9 9 56 165 88 122 150 91 114

54) The heights (in inches) of 30 mechanics are listed below. Construct a stem-and-leaf plot for the data. 54) _____

70 72 71 70 69 73 69 68 70 71
67 71 70 74 69 68 71 71 71 72
69 71 68 67 73 74 70 71 69 68

55) The March utility bills (in dollars) of 30 homeowners are listed below. Construct a stem-and-leaf plot for the data. 55) _____

44 38 41 50 36 36 43 42 49 48
35 40 37 41 43 50 45 45 39 38
50 41 47 36 35 40 42 43 48 33

56) The scores for an economics test are listed below. Create a stem-and-leaf plot for the data. 56) _____

87 76 95 77 94 90 88 85 66 89
79 99 50 91 83 88 82 56 19 69

Construct a dot plot for the data.

57) The local police, using radar, checked the speeds (in mph) of 30 motorists at a busy intersection. The results are listed below. Construct a dot plot for the data. 57) _____

44 38 41 50 36 36 43 42 49 48
35 40 37 41 43 50 45 45 39 38
50 41 47 36 35 40 42 43 48 33

58) The heights (in inches) of 30 mechanics are listed below. Construct a dot plot for the data.

70 72 71 70 69 73 69 68 70 71
67 71 70 74 69 68 71 71 71 72
69 71 68 67 73 74 70 71 69 68

58) ___
___
___
___
_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.
Construct a frequency distribution for the data using five classes. Describe the shape of the distribution.

59) The data set: Pick Three Lottery Outcomes for 10 Consecutive Weeks 59) _____

3 6 7 6 0 6 1 7 8 4
1 5 7 5 9 1 5 3 9 9
2 2 3 0 8 8 4 0 2 4

A) skewed to the left
B) skewed to the right
C) uniform
D) bell shaped

60) The data set: ages of dishwashers (in years) in 20 randomly selected households 60) _____

12 6 4 9 11 1 7 8 9 8
9 13 5 15 7 6 8 8 2 1

A) skewed to the right
B) skewed to the left
C) bell shaped
D) uniform

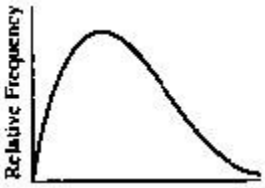
61) The data set: weekly grocery bills (in dollars) for 20 randomly selected households 61) _____

135 120 115 132 136 124 119 145 98 110
125 120 115 130 140 105 116 121 125 108

A) bell shaped
B) skewed to the left
C) uniform
D) skewed to the right

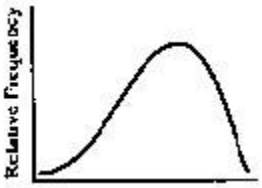
Describe the shape of the distribution.

62) 62) _____



A) bell shaped
B) skewed to the right
C) uniform
D) skewed to the left

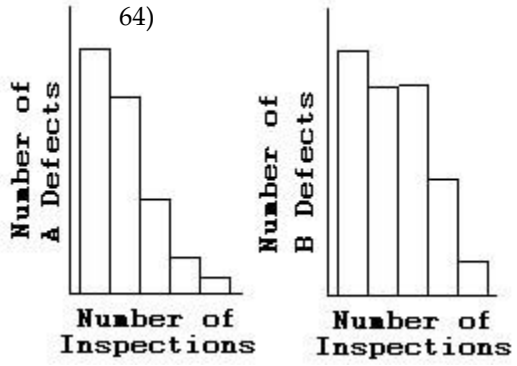
63) 63) _____



A) uniform
B) skewed to the left
C) bell shaped
D) skewed to the right

Use the histograms shown to answer the question.

64)

64) 

Is either histogram symmetric?

A) The first is symmetric, but the second is not symmetric.
B) Both are symmetric.
C) The second is symmetric, but the first is not symmetric.
D) Neither is symmetric.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.
Describe the shape of the distribution.

65) A sample of 15 Little League players was selected and their weights (in pounds) were recorded as follows: 65) _____

97	120	137	124	117
108	134	126	123	106
130	110	100	120	140

Construct a frequency polygon for the data.

66) 66) _____

Height (in inches)	Frequency
50 – 52	5
53 – 55	8
56 – 58	12
59 – 61	13
62 – 64	11

67) 67) _____

Weight (in pounds)	Frequency
135 – 139	6
140 – 144	4
145 – 149	11
150 – 154	15
155 – 159	8

68) The grade point averages for 40 evening students are listed below. Construct a frequency polygon using eight classes. 68) _____

2.0	3.2	1.8	2.9	0.9	4.0	3.3	2.9	3.6	0.8
3.1	2.4	2.4	2.3	1.6	1.6	4.0	3.1	3.2	1.8
2.2	2.2	1.7	0.5	3.6	3.4	1.9	2.0	3.0	1.1
3.0	4.0	4.0	2.1	1.9	1.1	0.5	3.2	3.0	2.2

69) The local police, using radar, checked the speeds (in mph) of 30 motorists in a construction area. The results are listed below. Construct a frequency polygon using six classes and a class width of 3. 69) _____

44	38	41	50	36	36	43	42	49	48
35	40	37	41	43	50	45	45	39	38
50	41	47	36	35	40	42	43	48	33

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. Determine whether the statement is true or false.

70) A frequency polygon always begins and ends with a frequency of zero. 70) _____
A) True B) False

71) The class midpoint can be determined by adding to the lower class limit one-half of the class width. 71) _____
A) True B) False

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question. Construct the requested frequency distribution.

72) The April precipitation amounts (in inches) for 40 cities are listed below. Construct a frequency distribution, a relative frequency distribution, a cumulative frequency distribution, and a relative cumulative frequency distribution using eight classes. 72) _____

2.0	3.2	1.8	2.9	0.9	4.0	3.3	2.9	3.6	0.8
3.1	2.4	2.4	2.3	1.6	1.6	4.0	3.1	3.2	1.8
2.2	2.2	1.7	0.5	3.6	3.4	1.9	2.0	3.0	1.1
3.0	4.0	4.0	2.1	1.9	1.1	0.5	3.2	3.0	2.2

73) The commute time (in minutes) of 30 executives are listed below. Construct a frequency distribution, a relative frequency distribution, a cumulative frequency distribution, and a relative cumulative frequency distribution using five classes. 73) _____

70	72	71	70	69	73	69	68	70	71
67	71	70	74	69	68	71	71	71	72
69	71	68	67	73	74	70	71	69	68

74) The local police, using radar, checked the speeds (in mph) of 30 motorists in a construction area. The results are listed below. Construct a frequency distribution, a relative frequency distribution, a cumulative frequency distribution, and a relative cumulative frequency distribution using six classes. 74) _____

44	38	41	50	36	36	43	42	49	48
35	40	37	41	43	50	45	45	39	38
50	41	47	36	35	40	42	43	48	33

Construct the requested ogive.

75) The grade point averages for 40 evening students are listed below. Construct a frequency ogive using eight classes. 75) _____

2.0	3.2	1.8	2.9	0.9	4.0	3.3	2.9	3.6	0.8
3.1	2.4	2.4	2.3	1.6	1.6	4.0	3.1	3.2	1.8
2.2	2.2	1.7	0.5	3.6	3.4	1.9	2.0	3.0	1.1
3.0	4.0	4.0	2.1	1.9	1.1	0.5	3.2	3.0	2.2

76) The heights (in inches) of 30 lawyers are listed below. Construct a frequency ogive using five classes.

70 72 71 70 69 73 69 68 70 71
67 71 70 74 69 68 71 71 71 72
69 71 68 67 73 74 70 71 69 68

77) The local police, using radar, checked the speeds (in mph) of 30 motorists on a rural road. The results are listed below. Construct a frequency ogive using six classes. 77) _____

44 38 41 50 36 36 43 42 49 48
35 40 37 41 43 50 45 45 39 38
50 41 47 36 35 40 42 43 48 33

78) The grade point averages for 40 evening students are listed below. Construct a relative frequency ogive using eight classes. 78) _____

2.0 3.2 1.8 2.9 0.9 4.0 3.3 2.9 3.6 0.8
3.1 2.4 2.4 2.3 1.6 1.6 4.0 3.1 3.2 1.8
2.2 2.2 1.7 0.5 3.6 3.4 1.9 2.0 3.0 1.1
3.0 4.0 4.0 2.1 1.9 1.1 0.5 3.2 3.0 2.2

79) The heights (in inches) of 30 lawyers are listed below. Construct a relative frequency ogive using five classes. 79) _____

70 72 71 70 69 73 69 68 70 71
67 71 70 74 69 68 71 71 71 72
69 71 68 67 73 74 70 71 69 68

80) The local police, using radar, checked the speeds (in mph) of 30 motorists on a rural road. The results are listed below. Construct a relative frequency ogive using six classes. 80) _____

44 38 41 50 36 36 43 42 49 48
35 40 37 41 43 50 45 45 39 38
50 41 47 36 35 40 42 43 48 33

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. Provide an appropriate response.

81) An ogive is a graph that represents cumulative frequencies or cumulative relative frequencies. The points labeled on the horizontal axis are the 81) _____

A) Lower class limits
B) Upper class limits
C) Frequencies
D) Midpoints

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question. Use a time series plot to display the data. Comment on the trend,

82) The data below represent the consumption of high-energy drinks (in gallons) by adult Americans over a nine-year period. 82) _____

Year	1	2	3	4	5	6	7	8	9
Consumption (gal)	10	11	11	12	13	14	15	15	13

83) A transportation engineer wishes to use the following data to illustrate the number of deaths from the collision of passenger cars with motorcycles on a particular highway.

Year	Number of Deaths
1	12
2	17
3	22
4	21
5	16
6	13
7	11

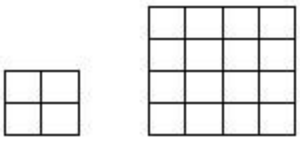
83) _____

84) Women were allowed to enter the Boston Marathon for the first time in 1972. Listed below are the winning women's times (in minutes) for the first 10 years. 84) _____

Year	1	2	3	4	5	6	7	8	9	10
Time	190	186	167	162	167	168	165	155	154	147

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. Explain what is misleading about the graphic.

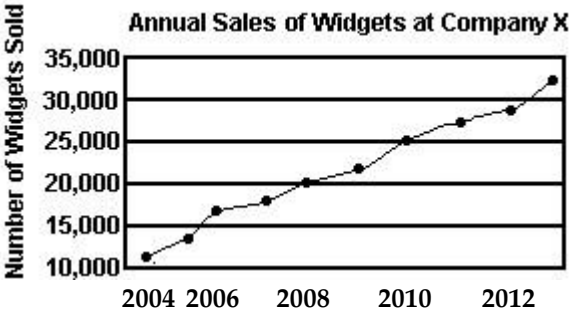
85) 85) _____



The volume of our sales has doubled!!!

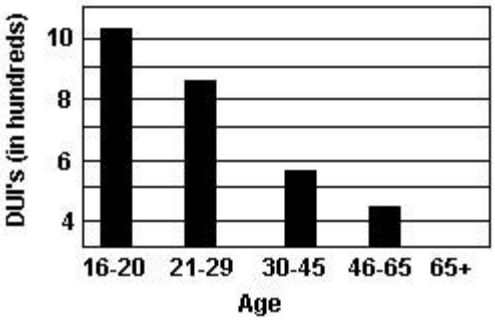
A) The length of a side has doubled, but the area has been multiplied by 8.
B) The graphic is not misleading.
C) The length of a side has doubled, but the area has been multiplied by 4.
D) The length of a side has doubled, but the area has been unchanged.

86) 86) _____



A) The vertical scale does not begin at zero.
B) The graphic is not misleading.
C) The trend is depicted in the wrong direction.
D) The horizontal label is incomplete.

87) **2012 DUI Figures for State County** 87) _____

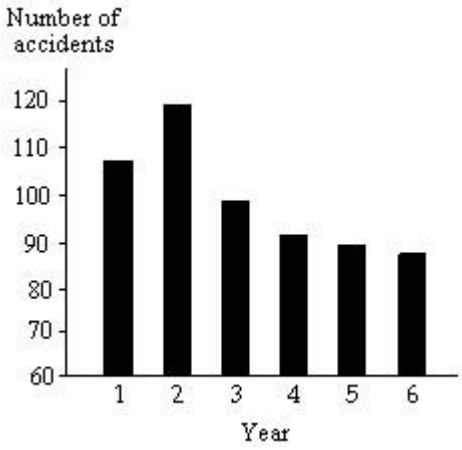


A) The graphic may give the impression that drivers over age 65 had no DUI's in 2012.
B) The graphic is not misleading.
C) The horizontal scale does not begin at zero.
D) The graphic only includes information for one year.

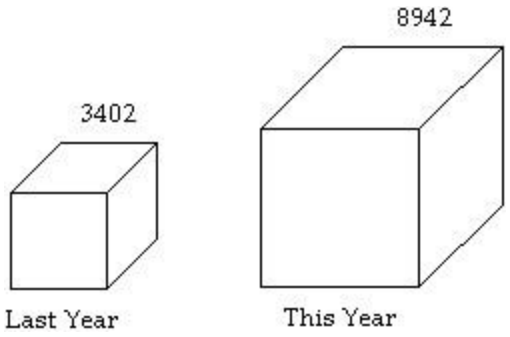
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

88) The following graph shows the number of car accidents occurring in one city in each of the years 2006 through 2011 (Year 1 = 2006, Year 2 = 2007 etc). The number of accidents dropped in 2008 after a new speed limit was imposed. How is the bar graph misleading? How would you redesign the graph to be less misleading? 88) _____



89) A parcel delivery store finds that their delivery rates increased over the past year. Last year it delivered 3402 parcels. This year it delivered 8942 parcels. 89) _____



How many times larger should the graphic for this year be than the graphic for last year?

1)

Class	Frequency	Relative Frequency	Percentage
Large	345	0.190	19.0
Medium	830	0.456	45.6
Small	645	0.354	35.4
Total	1820		1.000

100.0

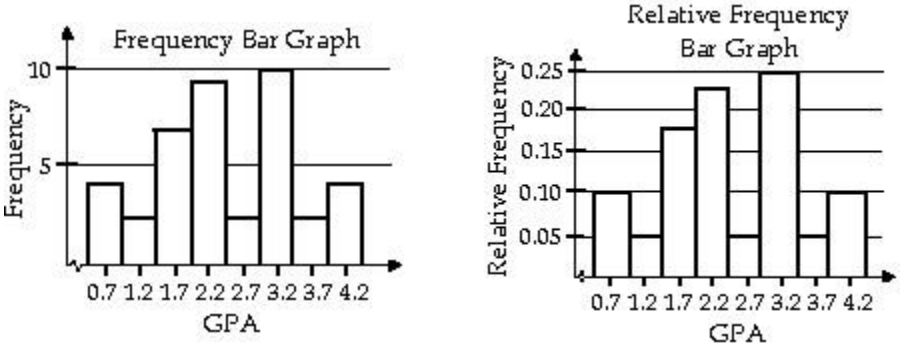
2)

Response	Frequency	Relative Frequency
Strongly Favor	25	0.125
Favor	26	0.13
Neutral	8	0.04
Oppose	22	0.11
Strongly Oppose	119	0.595

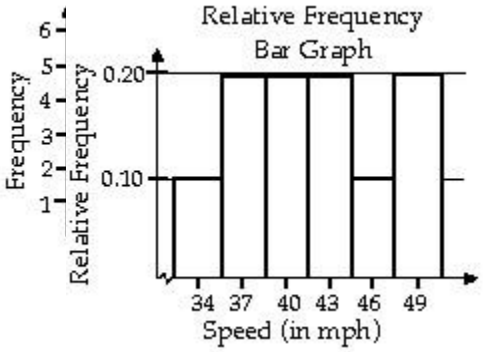
3)

Color	Frequency	Relative Frequency
yellow	3	0.15
blue	4	0.20
purple	5	0.25
red	7	0.35
green	1	0.05

4) B
5) A
6) B
7) D
8) C
9) B
10) A
11) D
12) B
13) B
14) C
15) C
16)



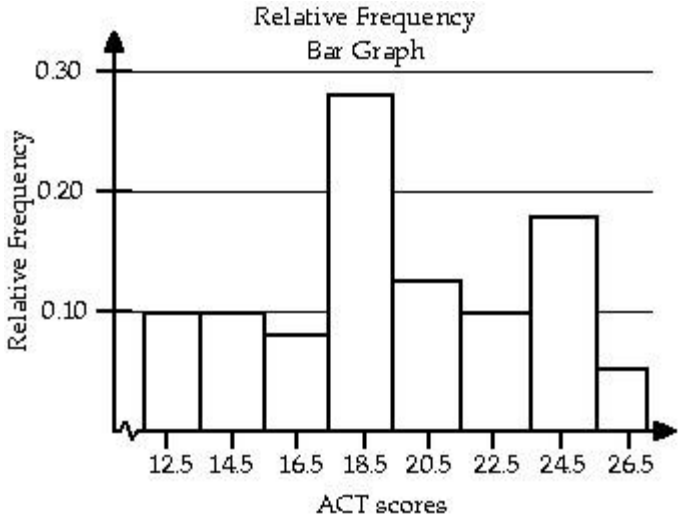
17)



18) a) See graph below

b) The minimum score = 14

c) The university will accept 76.57% of the applicants.



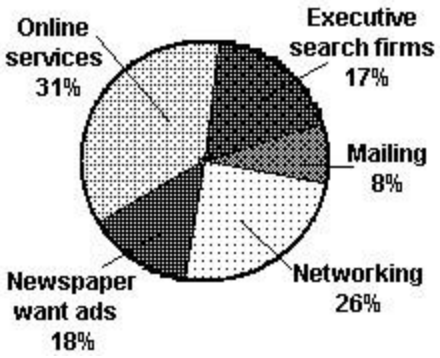
19) A

20) C

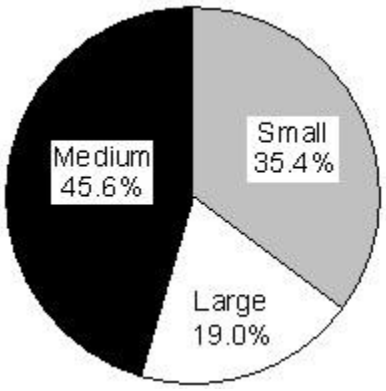
21) D

22) A

23)



24)



25) B

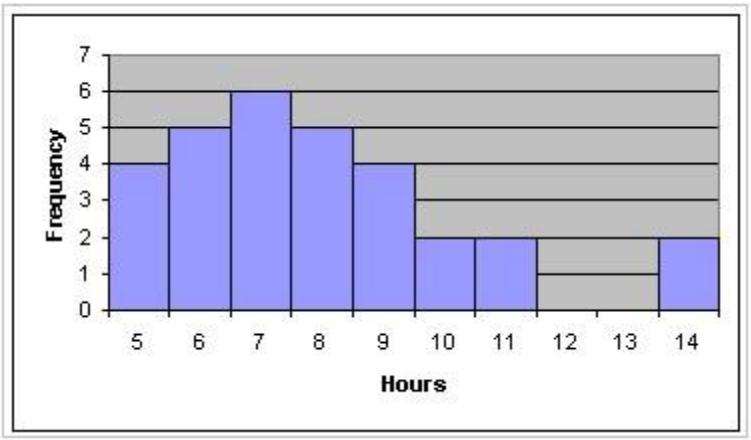
26)

Hours On Net	Number of HS Students
13	4
14	5
15	6
16	5
17	4
18	2
19	2
22	2

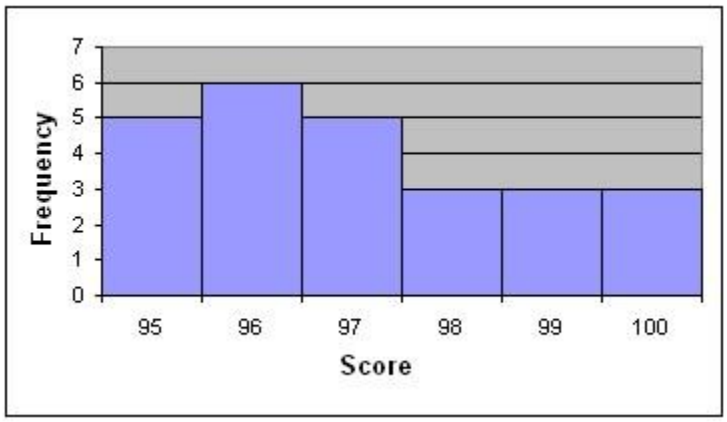
27)

Measure	Frequency
95	5
96	6
97	5
98	3
99	3
100	3

28)



29)



30) A
31) D
32) B
33) A
34) D
35) C
36) B
37) B
38) B
39)

Precip.	Frequency	Relative Frequency
0.5–0.9	4	0.10
1.0–1.4	2	0.05
1.5–1.9	7	0.175
2.0–2.4	9	0.225
2.5–2.9	2	0.05
3.0–3.4	10	0.25
3.5–3.9	2	0.05
4.0–4.4	4	0.10

40)

Commute Time (in min)	Frequency	Relative Frequency
67.0–68.4	6	0.200
68.5–69.9	5	0.167
70.0–71.4	13	0.433
71.5–72.9	2	0.067
73.0–74.4	4	0.133

41)

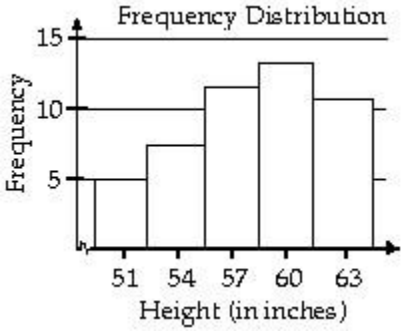
Util. Bill (dollars)	Frequency	Relative Frequency
33–35	3	0.10
36–38	6	0.20
39–41	6	0.20
42–44	6	0.20
45–47	3	0.10
48–50	6	0.20

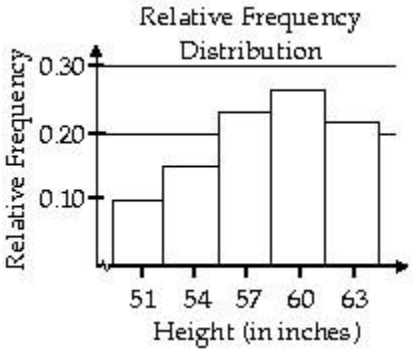
42) a. 95-104, 105-114, 115-124, 125-134, 135-144

b.

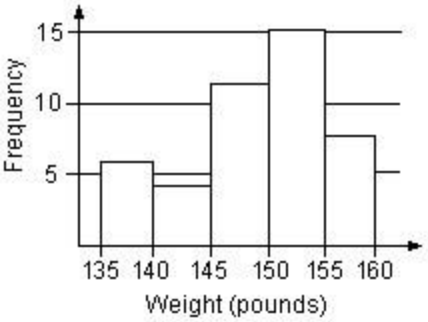
Weight (lb)	Tally	Frequency
95–104	II	2
105–114	III	3
115–124	IIIII	5
125–134	III	3
135–144	II	2

43)

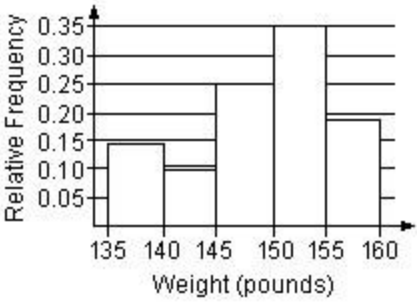




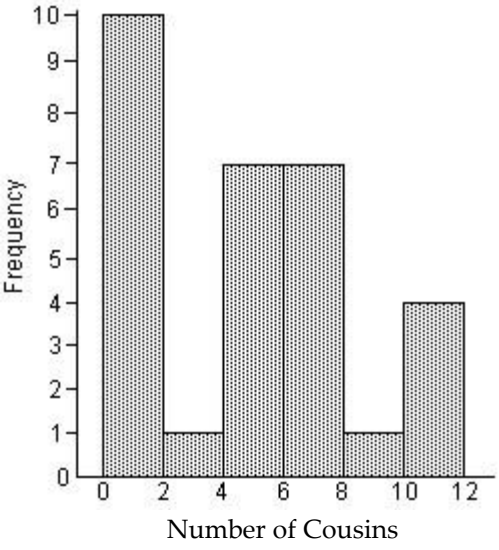
44) Frequency Histogram:



Relative Frequency Histogram:

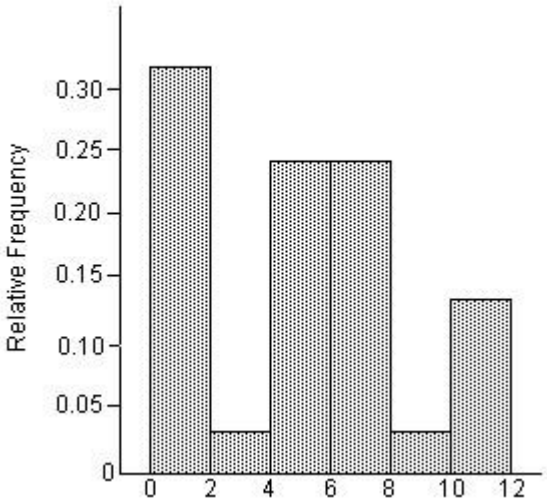


45)

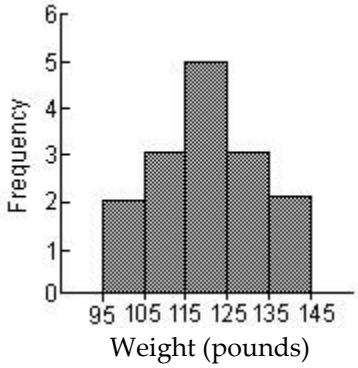


46)

Number of Cousins



47)



48) D

49) D

50) 72, 82, 90, 99, 100, 115, 118, 126, 129, 136, 137, 139, 142, 143, 148, 149, 155, 159

51) 5.9, 6.2, 7.0, 7.5, 8.6, 9.0, 9.3, 10.6, 10.9, 11.6, 11.7, 11.9, 12.2, 12.3, 12.8, 12.9, 13.9, 13.9

52)

0 | 3 9 9
1 |
2 | 2
3 | 2 3 9 9
4 | 2 9
5 | 2 8
6 |
7 | 0

53)

0 | 0 9 9
1 |
2 | 5
3 |
4 |
5 | 6 6
7 |
8 | 8
9 | 1
10 | 2

11| 14|
4 15| 0
12| 16| 5
2
13|

54)

6 | 7 7 8 8 8 9 9 9 9
7 | 0 0 0 0 0 1 1 1 1 1 1 1 2 2 3 3 4 4

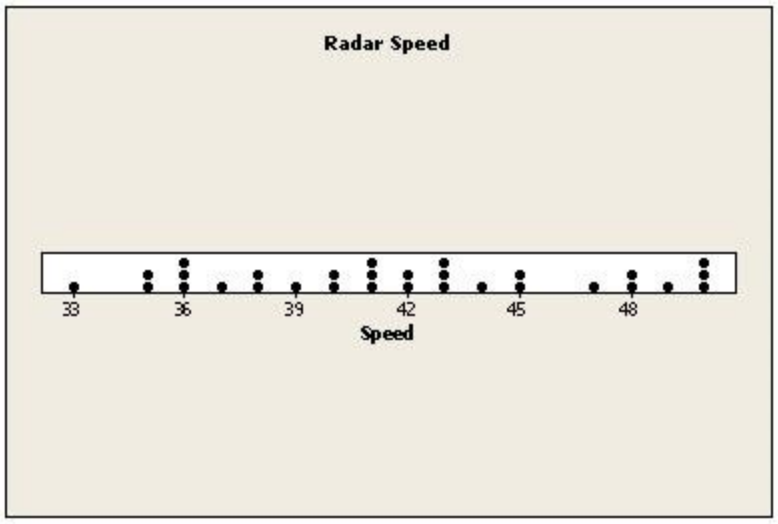
55)

3 | 3 5 5 6 6 6 7 8 8 9
4 | 0 0 1 1 1 2 2 3 3 3 4 5 5 7 8 8 9
5 | 0 0 0

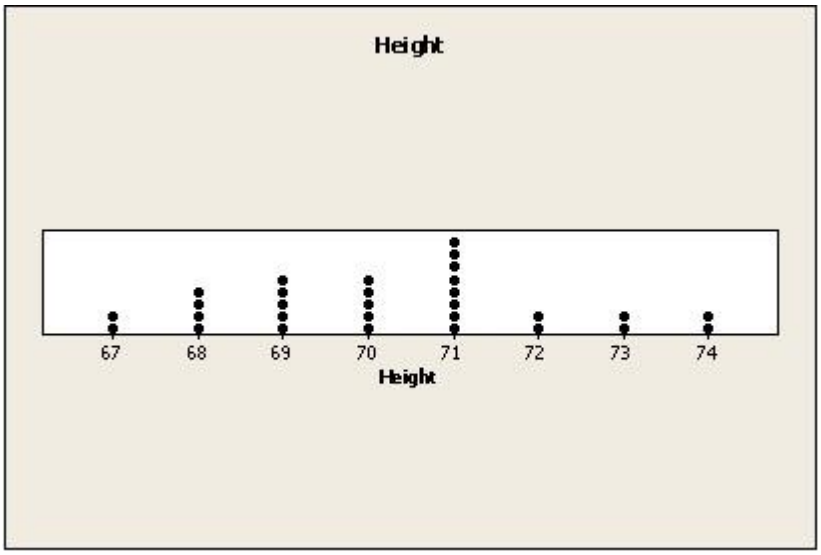
56) The stem will consist of the tens digit and range from 1 to 9. The leaves will be drawn in the appropriate stems based on the data values.

Stem	Leaves
1	9
2	
3	
4	
5	0 6
6	6 9
7	6 7 9
8	7 8 5 9 3 8 2
9	5 4 0 9 1

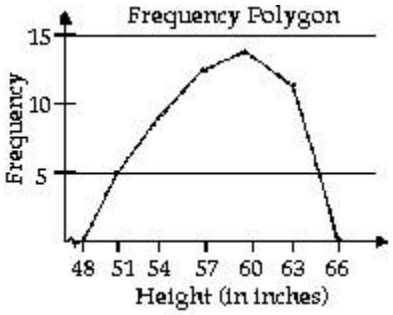
57)



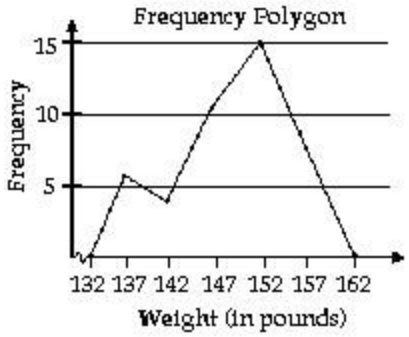
58)



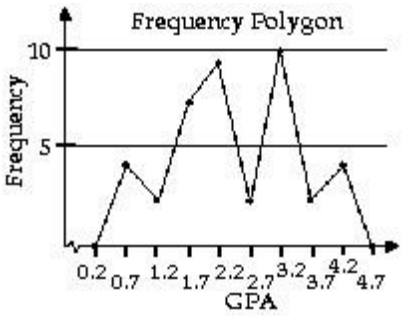
59) C
60) C
61) A
62) B
63) B
64) D
65) symmetric
66)



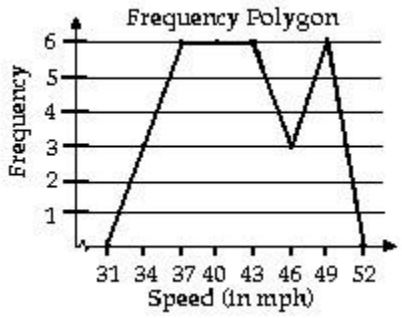
67)



68)



69)



70) A

71) A

72)

Precip (in.)	Frequency	Relative Frequency	Cumulative Frequency	Cumulative Relative Frequency
0.5–0.9	4	0.10	4	0.10
1.0–1.4	2	0.05	6	0.15
1.5–1.9	7	0.175	13	0.325
2.0–2.4	9	0.225	22	0.55
2.5–2.9	2	0.05	24	0.60
3.0–3.4	10	0.25	34	0.85
3.5–3.9	2	0.05	36	0.90
4.0–4.4	4	0.10	40	1

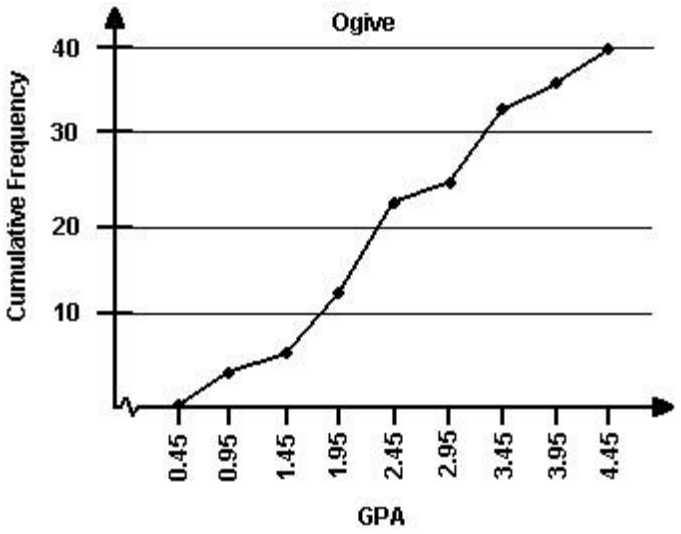
73)

Commute Time (in min)	Frequency	Relative Frequency	Cumulative Frequency	Cumulative Relative Frequency
67.0–68.4	6	0.20	6	0.20
68.5–69.9	5	0.167	11	0.367
70.0–71.4	13	0.433	24	0.80
71.5–72.9	2	0.067	26	0.867
73.0–74.4	4	0.133	30	1

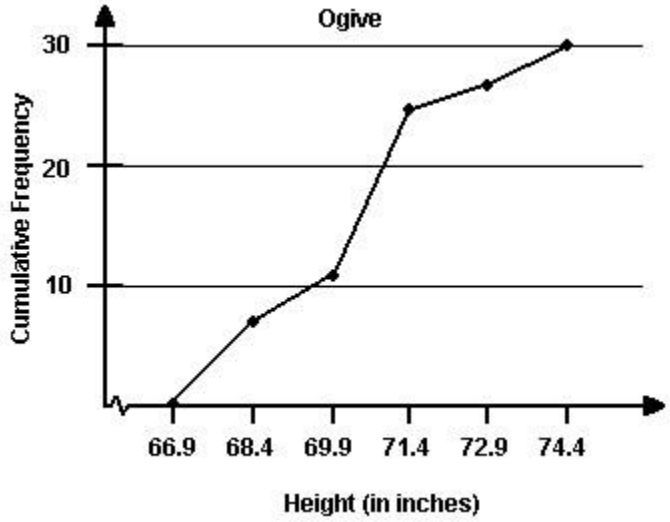
74)

Speed (in mph)	Frequency	Relative Frequency	Cumulative Frequency	Cumulative Relative Frequency
33–35	3	0.10	3	0.10
36–38	6	0.20	9	0.30
39–41	6	0.20	15	0.50
42–44	6	0.20	21	0.70
45–47	3	0.10	24	0.80
48–50	6	0.20	30	1

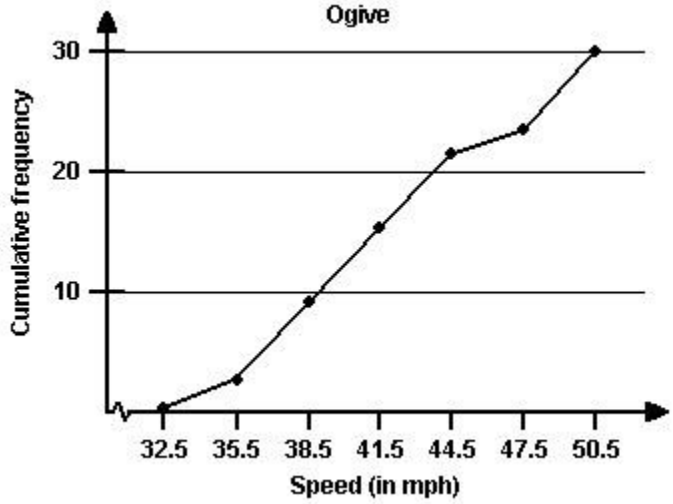
75)


Ogive
Cumulative Frequency
40
30
20
10
0.45
0.95
1.45
1.95
2.45
2.95
3.45
3.95
4.45
GPA

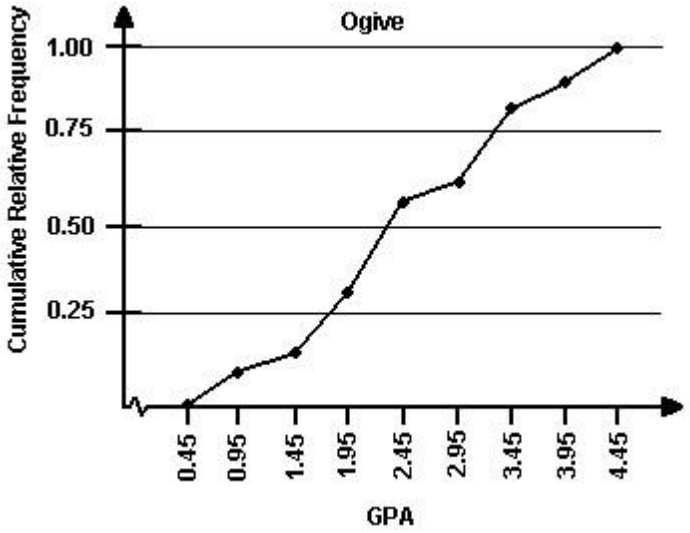
76)


Ogive
Cumulative Frequency
30
20
10
66.9
68.4
69.9
71.4
72.9
74.4
Height (in inches)

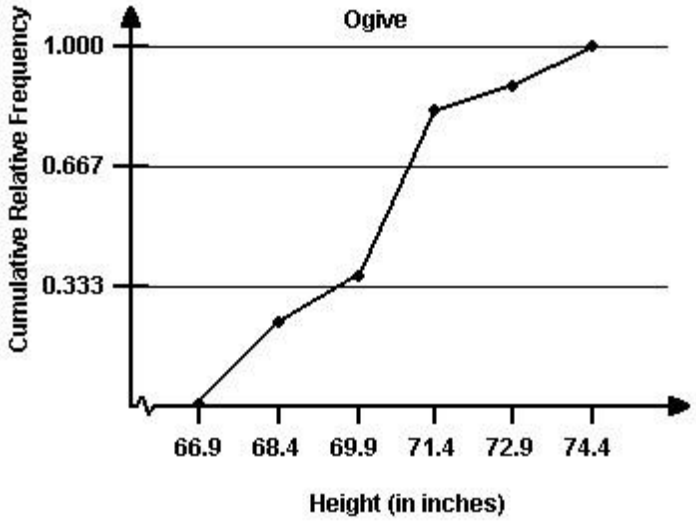
77)


Ogive
Cumulative frequency
30
20
10
32.5
35.5
38.5
41.5
44.5
47.5
50.5
Speed (in mph)

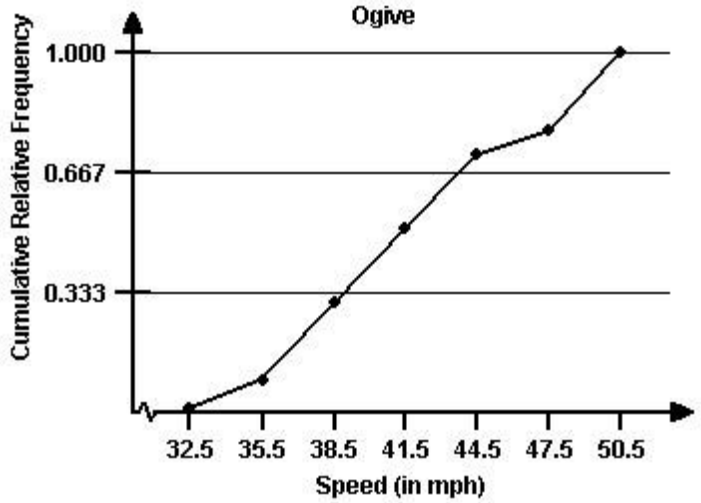
78)



79)

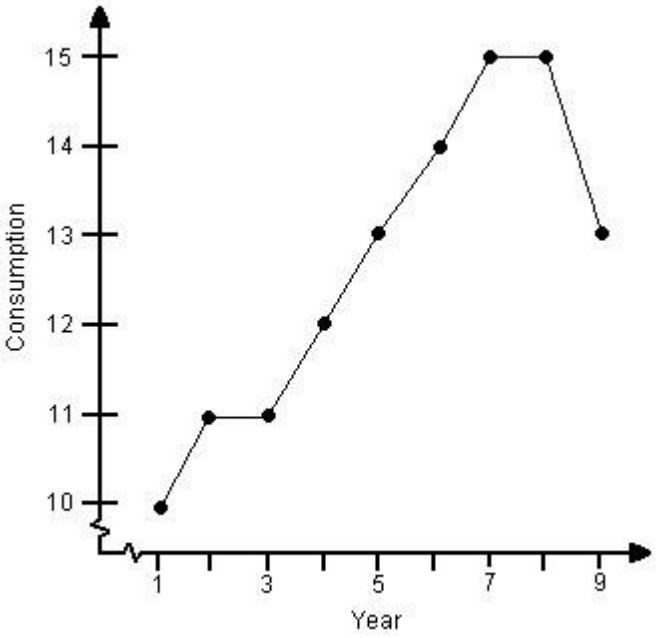


80)

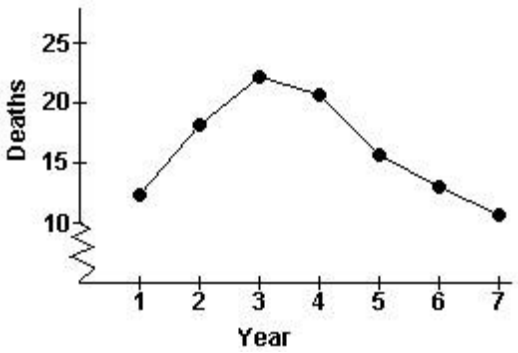


81) B

82) In general, there is an increasing trend in high-energy drinks consumption of adult Americans. However, beginning in Year 9, there is sign of a decreasing trend.

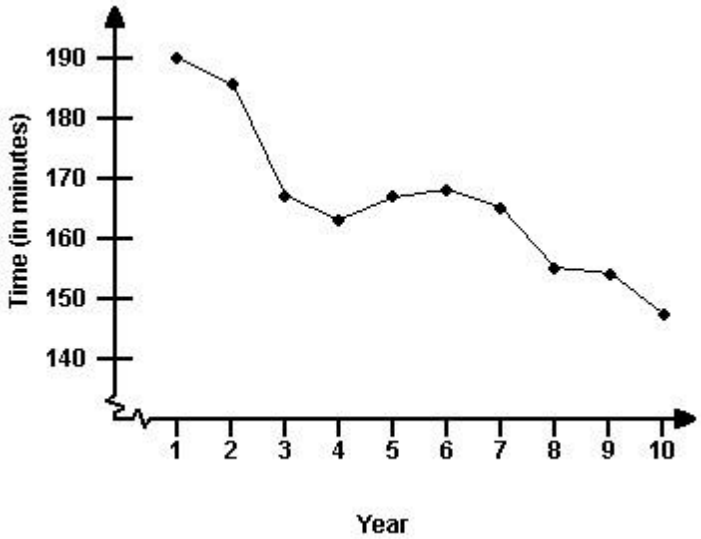


83)



From Year 1 to Year 3, there was an increasing trend in the number of collision deaths. Subsequently, there was a decreasing trend.

84)



In general, there was a decreasing trend in women's Boston marathon times.

85) C

86) A

87) A

88) The bar graph is misleading because the vertical axis starts at 60 instead of 0. This tends to indicate that the number

of ents decreased at a faster rate than they actually did. The graph would be less misleading if the vertical scale began accid at 0 or if a symbol were used to clearly indicate that the vertical scale is truncated and has a gap.

89) roughly 3 times larger