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

Use the given frequency distribution to find the
(a) class width.
(b) class midpoints of the first class.
(c) class boundaries of the first class.

1) **Height (in inches)** 1) _____

Class	Frequency, f
50 - 52	5
53 - 55	8
56 - 58	12
59 - 61	13
62 - 64	11

A) (a) 3
(b) 51
(c) 49.5-52.5

B) (a) 2
(b) 51.5
(c) 50-52

C) (a) 2
(b) 51.5
(c) 49.5-52.5

D) (a) 3
(b) 51
(c) 50-52

2) **Phone Calls (per day)** 2) _____

Class	Frequency, f
8 - 11	18
12 - 15	23
16 - 19	38
20 - 23	47
24 - 27	32

A) (a) 3
(b) 9.5
(c) 7.5-11.5

B) (a) 3
(b) 10.5
(c) 8-11

C) (a) 4
(b) 10.5
(c) 8-11

D) (a) 4
(b) 9.5
(c) 7.5-11.5

3) **Weight (in pounds)** 3) _____

Class	Frequency, f
135 - 139	6
140 - 144	4
145 - 149	11
150 - 154	15
155 - 159	8

A) (a) 4
(b) 137.5
(c) 134.5-139.5

B) (a) 4
(b) 137.5
(c) 135-139

C) (a) 5
(b) 137
(c) 134.5-139.5

D) (a) 5
(b) 137
(c) 135-139

4) **Miles (per day)** 4) _____

Class	Frequency, f
1 - 2	9
3 - 4	22
5 - 6	28
7 - 8	15
9 - 10	4

A) (a) 1
(b) 1
(c) 1-2

B) (a) 2
(b) 1
(c) 1-2

C) (a) 1
(b) 1.5
(c) 0.5-2.5

D) (a) 2
(b) 1.5
(c) 0.5-2.5

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

Use the maximum and minimum data entries and the number of classes to find the class width, the lower class limits, and the upper class limits.

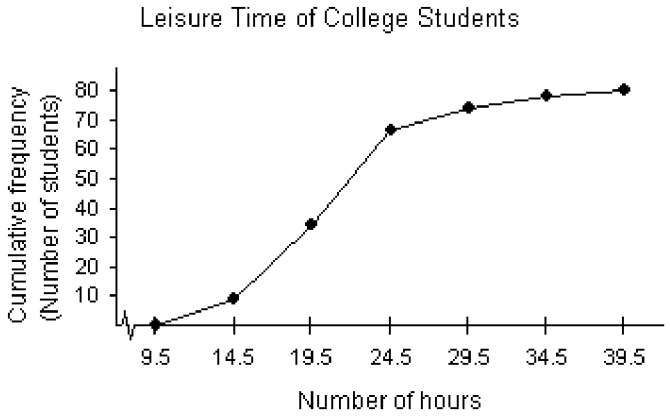
5) min = 1, max = 30, 6 classes 5) _____

6) min = 80, max = 265, 6 classes 6) _____

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

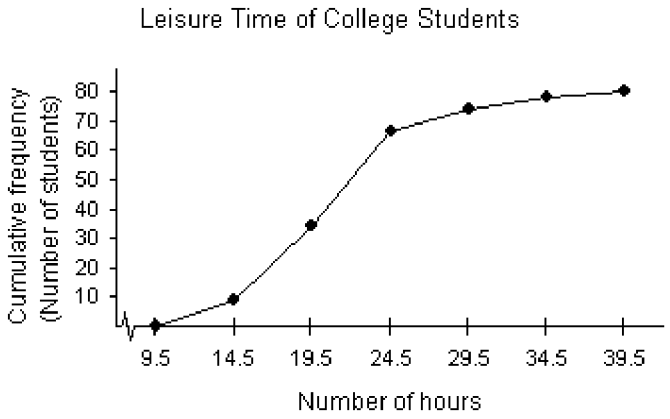
Provide an appropriate response.

7) Use the ogive below to approximate the number in the sample. 7) _____



A) 28 B) 100 C) 341 D) 80

8) Use the ogive below to approximate the cumulative frequency for 24 hours. 8) _____

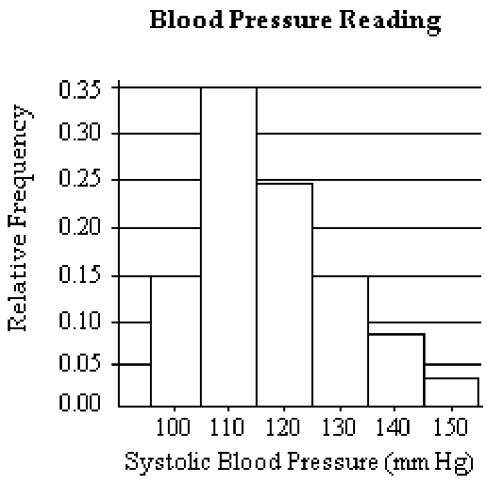


A) 63 B) 75 C) 17 D) 27

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

Use the relative frequency histogram to
a) identify the class with the greatest, and the class with the least, relative frequency.
b) approximate the greatest and least relative frequencies.
c) approximate the relative frequency of the fifth class.

9) 9) _____



Use the given frequency distribution to construct a frequency histogram, a relative frequency histogram and a frequency polygon.

10) **Height (in inches)** 10) _____

Class	Frequency, f
50 - 52	5
53 - 55	8
56 - 58	12
59 - 61	13
62 - 64	11

11) **Weight (in pounds)** 11) _____

Class	Frequency, f
135 - 139	6
140 - 144	4
145 - 149	11
150 - 154	15
155 - 159	8

Use the given frequency distribution to construct a cumulative frequency distribution and an ogive.

12) **Phone Calls (per day)** 12) _____

Class	Frequency, f
8 - 11	18
12 - 15	23
16 - 19	38
20 - 23	47
24 - 27	32

13) **Height (in inches)** 13) _____

Class	Frequency, f
50 - 52	5
53 - 55	8
56 - 58	12
59 - 61	13
62 - 64	11

14) **Weight (in pounds)** 14) _____

Class	Frequency, f
135 - 139	6
140 - 144	4
145 - 149	11
150 - 154	15
155 - 159	8

15) **Miles (per day)** 15) _____

Class	Frequency, f
1 - 2	9
3 - 4	22
5 - 6	28
7 - 8	15
9 - 10	4

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

Provide an appropriate response.

16) A city in the Pacific Northwest recorded its highest temperature at 91 degrees Fahrenheit and its lowest temperature at 12 degrees Fahrenheit for a particular year. Use this information to find the upper and lower limits of the first class if you wish to construct a frequency distribution with 10 classes. 16) _____

A) 7-17 B) 12-18 C) 12-19 D) 12-20

17) A sample of candies have weights that vary from 2.35 grams to 4.75 grams. Use this information to find the upper and lower limits of the first class if you wish to construct a frequency distribution with 12 classes. 17) _____

A) 2.35-2.54 B) 2.35-2.55 C) 2.35-2.75 D) 2.35-2.65

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

The grade point averages for 40 students are listed below.

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**

18) Construct a frequency distribution, a relative frequency distribution, and a cumulative frequency distribution using eight classes. Include the midpoints of the classes. 18) _____

19) Construct a frequency histogram, a relative frequency histogram and a frequency polygon using eight classes. 19) _____

20) Construct an ogive using eight classes. 20) _____

The heights (in inches) of 30 adult males are listed below.

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**

21) Construct a frequency distribution, a relative frequency distribution, and a cumulative frequency distribution using five classes. 21) _____

22) Construct a frequency histogram using five classes. 22) _____

23) Construct a relative frequency histogram using five classes. 23) _____

24) Construct a frequency polygon using five classes. 24) _____

25) Construct a ogive using five classes. 25) _____

The Highway Patrol, using radar, checked the speeds (in mph) of 30 passing motorists at a checkpoint. The results are listed below.

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**

26) Construct a frequency distribution, a relative frequency distribution, and a cumulative frequency distribution using six classes. 26) _____

27) Construct a frequency histogram, a relative frequency histogram and a frequency polygon using six classes. 27) _____

28) Construct an ogive using six classes. 28) _____

Provide an appropriate response.

29) Listed below are the ACT scores of 40 randomly selected students at a major university. 29) _____

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 histogram 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?

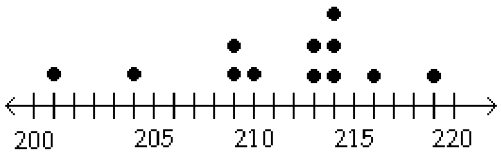
30) Explain the difference between class limits and class boundaries. 30) _____

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

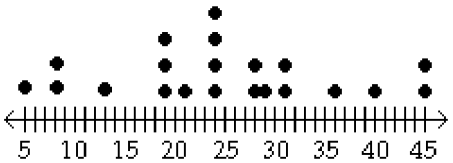
Match the description of the sample with the correct plot.

31) Time (in minutes) it takes a sample of employees to drive to work 31) _____

A)



B)



C) Key: 7|2 = 72

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

D) Key: 0|9 = 0.9

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

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

Provide an appropriate response.

32) The numbers of home runs that Sammy Sosa hit in the first 15 years of his major league baseball career are listed below. Make a stem-and-leaf plot for this data. What can you conclude about the data? 32) _____

4 15 10 8 33 25 36 40 36 66 63 50 64 49 40

33) The numbers of home runs that Barry Bonds hit in the first 18 years of his major league baseball career are listed below. Make a stem-and-leaf plot for this data. What can you conclude about the data? 33) _____

16	25	24	19	33	25	34	46	37
33	42	40	37	34	49	73	46	45

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

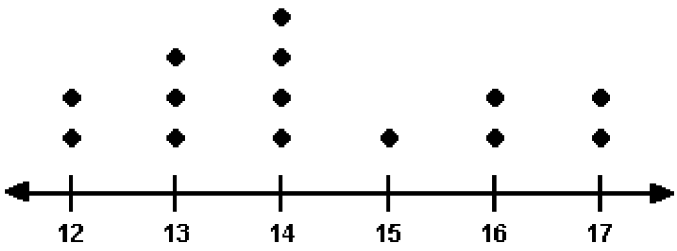
34) For the stem-and-leaf plot below, what is the maximum and what is the minimum entry? 34) _____

Key : 11| 9 = 11.9

11	6 9
12	4 6 6 7 8 9
13	0 1 1 2 3 6 6 7 8 8
14	3 4 6 6 8 9 9 9
15	0 1 1 2 3 7 7 8 9
16	2 2 5 7 8 8 9 9
17	7 8

A) max: 17.8; min: 11.9
B) max: 17.8; min: 11.6
C) max: 17.7; min: 11.6
D) max: 178; min: 116

35) For the dot plot below, what is the maximum and what is the minimum entry? 35) _____



A) max: 14; min: 12
B) max: 54; min: 15
C) max: 54; min: 12
D) max: 17; min: 12

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

36) The heights (in inches) of 30 adult males are listed below. Construct a stem-and-leaf chart for the data. 36) _____
What can you conclude about the data?

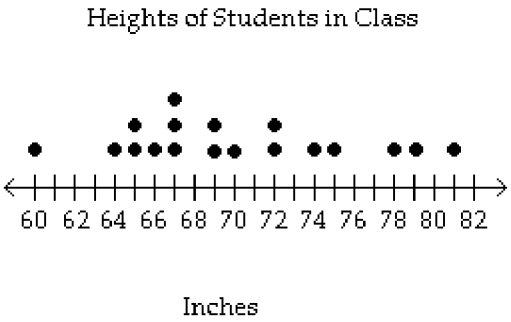
70	72	71	70	69	73	69	68	70	71
67	71	70	74	69	68	71	71	71	72
69	71	68	67	73	74	70	71	69	68

37) The Highway Patrol, using radar, checked the speeds (in mph) of 30 passing motorists at a checkpoint. The results are listed below. Construct a stem-and-leaf plot for the data, listing each stem twice. What can you conclude about the data? 37) _____

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.

38) Display the data below in a stem-and-leaf plot. 38) _____



A)

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

B)

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

C)

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

D)

5	0
6	0
7	7
8	1

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

39) The Highway Patrol, using radar, checked the speeds (in mph) of 30 passing motorists at a checkpoint. The results are listed below. Construct a dot plot for the data. 39) _____

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

40) The heights (in inches) of 30 adult males are listed below. Construct a dot plot for the data. 40) _____

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

41) A study was conducted to determine how people get jobs. Four hundred subjects were randomly selected and the results are listed below. 41) _____

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

Construct a pie chart of the data.

42) A study was conducted to determine how people get jobs. Four hundred subjects were randomly selected and the results are listed below. 42) _____

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

Construct a Pareto chart of the data.

43) The heights (in inches) of 30 adult males are listed below. Construct a Pareto chart for the data. 43) _____

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

44) Use a scatter plot to display the data below. All measurements are in milligrams per cigarette. 44) _____

Brand	Tar	Nicotine
Benson & Hedges	16	1.2
Lucky Strike	13	1.1
Marlboro	16	1.2
Viceroy	18	1.4
True	6	0.6

45) The numbers of home runs that Barry Bonds hit in the first 10 years of his major league baseball career are listed below. Use a scatter plot to display the data. Is there a relationship between the home runs and the batting averages? 45) _____

Home Runs	16	25	24	19	33	25	34	46	37	33
Batting Average	.223	.261	.283	.248	.301	.292	.311	.336	.312	.294

46) The data below represent the numbers of absences and the final grades of 15 randomly selected students from a statistics class. Use a scatter plot to display the data. Is there a relationship between the students' absences and their final grades? 46) _____

Student	Number of Absences	Final Grade as a Percent
1	5	79
2	6	78
3	2	86
4	12	56
5	9	75
6	5	90
7	8	78
8	15	48
9	0	92
10	1	78
11	9	81
12	3	86
13	10	75
14	3	89
15	11	65

47) The data below represent the infant mortality rates and the life expectancies for seven selected countries in Africa. Use a scatter plot to display the data. 47) _____

Infant Mortality	63	199	71	61	67	35	194
Life Expectancy	45	31	51	47	39	70	37

48) The data below represent the smoking prevalence among U.S. adults over a 35-year period. Use a time series chart to display the data. Describe any trends shown. 48) _____

Year	1965	1985	1990	1995	2000
Percent of Smokers	42	30	25	25	23

49) A safety engineer wishes to use the following data to show the number of deaths from the collision of passenger cars with trucks on a particular highway. Use a time series chart to display the data. Describe any trends shown. 49) _____

Year	Number of Deaths
1930	12
1940	17
1950	22
1960	21
1970	16
1980	13
1990	11
2000	12

50) 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. Use a time series chart to display the data. 50) _____

Year	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Time	190	186	167	162	167	168	165	155	154	147

51) The five longest winning streaks for NCAA Men's Division I Basketball are listed below. Construct a Pareto chart for the data. 51) _____

University	Number of Games
Indiana	57
San Francisco	51
UCLA	76
Marquette	56
Kentucky	54

52) The lengths, in kilometers, of the world's largest subway systems are listed below. Construct a Pareto chart for the data. 52) _____

City	Length
Moscow	340
Paris	211
London	415
Tokyo	281
New York City	371

53) The number of beds in a sample of 24 hospitals are listed below. Construct a stem-and-leaf plot for the data. 53) _____

149	167	162	127	130	180	160	167
221	145	137	194	207	150	254	262
244	287	137	204	166	174	180	151

54) The number of minutes that a dentist kept 20 patients waiting beyond their appointment times are listed below. Construct a stem-and-leaf plot for the data. 54) _____

12.9	12.1	9.6	9.8	11.5	13.0	10.5	10.3	15.7	11.3
10.7	10.0	13.0	9.7	11.4	12.8	11.9	9.3	9.6	10.1

55) A study was conducted to determine how certain families pay on their credit card balances. Two hundred families with a household annual income between $25,000 and $49,999 were randomly selected and the results are listed below. Construct a pie chart of the data. 55) _____

Payment schedule	Frequency
Almost always pay off balance	97
Sometimes pay off balance	41
Hardly ever pay off balance	62

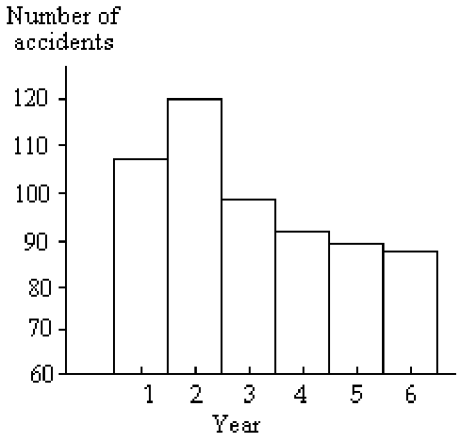
56) Of the 55 tornado fatalities in a recent year, the locations of the victims are listed below. Construct a pie chart of the data. 56) _____

Location	Fatalities
Mobile home	37
Permanent home	10
Vehicle	4
Business	2
Unknown	2

57) The data below represent the alcohol-related driving fatalities, in thousands, in the United States over a 20-year period. Use a time series chart to display the data. Describe any trends shown. 57) _____

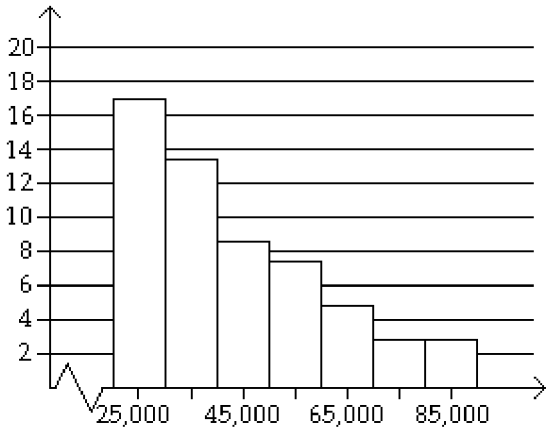
Year	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
Fatalities	25	23	24	22	20	18	18	17	17	17

58) The graph below shows the number of car accidents occurring in one city in each of the years 1 through 6. The number of accidents dropped in year 3 after a new speed limit was imposed. Does the graph distort the data? How would you redesign the graph to be less misleading? 58) _____



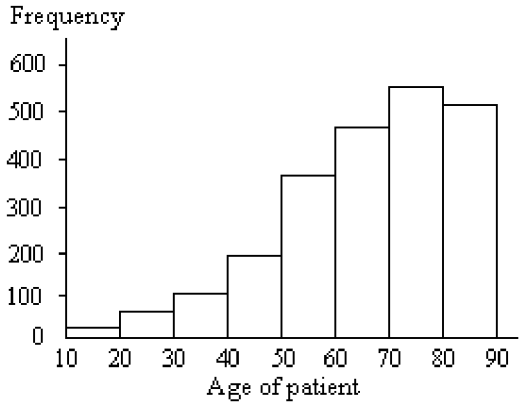
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

59) Determine whether the approximate shape of the distribution in the histogram is symmetric, uniform, skewed left, skewed right, or none of these. 59) _____



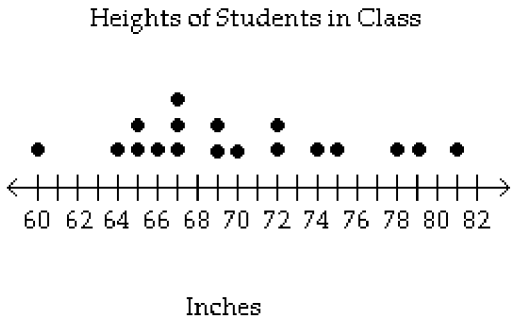
A) skewed right B) uniform C) skewed left D) symmetric

60) Determine whether the approximate shape of the distribution in the histogram is symmetric, uniform, skewed left, skewed right, or none of these. 60) _____



A) skewed right B) symmetric C) skewed left D) uniform

61) Find the mean, median, and mode of the data. 61) _____



A) $\bar{x}$ = 70; median = 69; mode = 67
B) $\bar{x}$ = 70; median = 67; mode = 69
C) $\bar{x} \approx$ 70.3; median = 69; mode = 68
D) $\bar{x} \approx$ 70.1; median = 69; mode = 68

For the given data , construct a frequency distribution and frequency histogram of the data using five classes. Describe the shape of the histogram as symmetric, uniform, skewed left, or skewed right.

62) Data set: California Pick Three Lottery 62) _____

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 left B) symmetric C) skewed right D) uniform

63) Data set: California Pick Three Lottery 63) _____

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

A) symmetric B) skewed left C) skewed right D) uniform

64) Data set: ages of 20 cars randomly selected in a student parking lot 64) _____

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

A) skewed left B) skewed right C) symmetric D) uniform

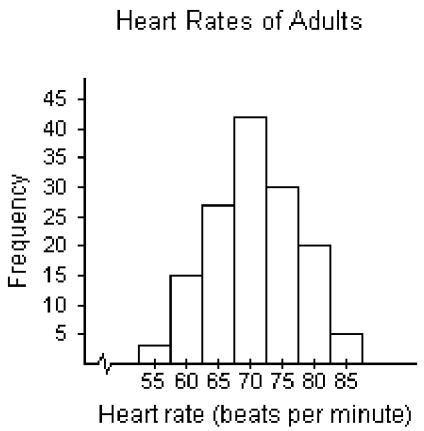
65) Data set: systolic blood pressures of 20 randomly selected patients at a blood bank 65) _____

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

A) skewed left B) skewed right C) symmetric D) uniform

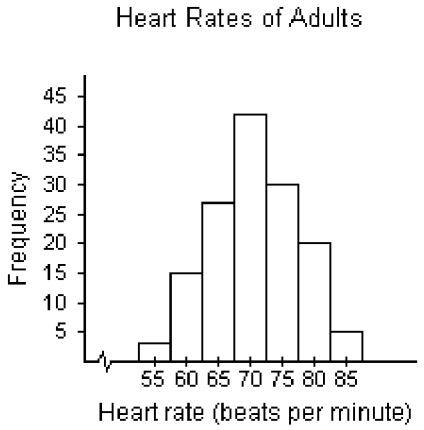
Provide an appropriate response.

66) Use the histogram below to approximate the mode heart rate of adults in the gym. 66) _____



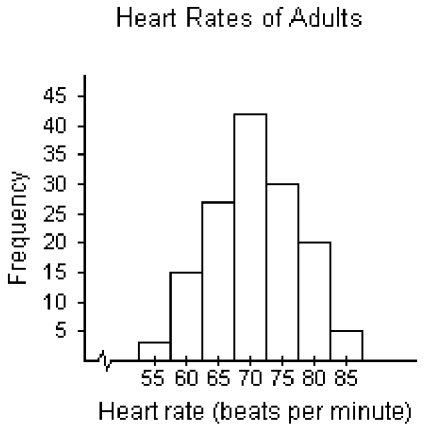
A) 70 B) 55 C) 42 D) 2

67) Use the histogram below to approximate the median heart rate of adults in the gym. 67) _____



A) 70 B) 42 C) 65 D) 75

68) Use the histogram below to approximate the mean heart rate of adults in the gym. 68) _____



A) 70.8 B) 70 C) 31.6 D) 1425.7

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

69) Find the mean, median, and mode of the following numbers: 69) _____

65 68 61 65 58 66 65 59 60 63

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

70) The top 14 speeds, in miles per hour, for Pro-Stock drag racing over the past two decades are listed below. Find the mean speed. 70) _____

181.1 202.2 190.1 201.4 191.3 201.4 192.2
201.2 193.2 201.2 194.5 199.2 196.0 196.2

A) 210.9 B) 201.2 C) 195.8 D) 196.1

71) The scores of the top ten finishers in a recent golf tournament are listed below. Find the mean score. 71) _____

71 67 67 72 76 72 73 68 72 72

A) 67 B) 71 C) 72 D) 68

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

72) The numbers of runs batted in that Sammy Sosa hit in the first 15 years of his major league baseball career are listed below. Find the mean and median number of runs batted in. Round the mean to the nearest whole number. 72) _____

13 70 33 25 93 70 119 100
119 158 141 138 160 108 103

73) The numbers of home runs that Barry Bonds hit in the first 18 years of his major league baseball career are listed below. Find the mean and median number of home runs. Round the mean to the nearest whole number. Which measure of central tendency - the mean or the median - best represents the data? Explain your reasoning. 73) _____

16	25	24	19	33	25	34	46	37
33	42	40	37	34	49	73	46	45

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

74) The top 14 speeds, in miles per hour, for Pro-Stock drag racing over the past two decades are listed below. Find the median speed. 74) _____

181.1	202.2	190.1	201.4	191.3	201.4	192.2
201.2	193.2	201.2	194.5	199.2	196.0	196.2

A) 201.2 B) 196.1 C) 195.8 D) 196.7

75) The scores of the top ten finishers in a recent golf tournament are listed below. Find the median score. 75) _____

67 67 68 71 72 72 72 72 73 76

A) 72 B) 71 C) 73 D) 67

76) The top 14 speeds, in miles per hour, for Pro-Stock drag racing over the past two decades are listed below. Find the mode speed. 76) _____

181.1	202.2	190.1	201.4	191.3	201.4	192.2
201.2	193.2	201.2	194.5	199.2	196.0	196.2

A) bimodal: 201.2, 201.4 B) 201.4
C) no mode D) 201.2

77) The scores of the top ten finishers in a recent golf tournament are listed below. Find the mode score. 77) _____

71 67 67 72 76 72 73 68 72 72

A) 73 B) 76 C) 72 D) 67

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

78) The amounts of money won by the top ten finishers in a recent Daytona 500 are listed below. Find the mean and median winnings. Round to the nearest dollar. Which measure - the mean or the median - best represents the data? Explain your reasoning. 78) _____

$2,194,246	$464,084	$164,096	$199,209	$438,834
$613,659	$142,884	$240,731	$145,809	$290,596

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

79) A student receives test scores of 62, 83, and 91. The student's final exam score is 88 and homework score is 76. Each test is worth 20% of the final grade, the final exam is 25% of the final grade, and the homework grade is 15% of the final grade. What is the student's mean score in the class? 79) _____

A) 76.6 B) 80.6 C) 90.6 D) 85.6

80) Grade points are assigned as follows: A = 4, B = 3, C = 2, D = 1, and F = 0. Grades are weighted according to credit hours. If a student receives an A in a four-credit class, a D in a two-credit class, a B in a three-credit class and a C in a three-credit class, what is the student's grade point average? 80) _____

A) 1.75 B) 2.75 C) 3.00 D) 2.50

Approximate the mean of the frequency distribution.

81) 81) _____

Miles (per day)	Frequency
1-2	15
3-4	28
5-6	11
7-8	14
9-10	9

A) 5 B) 15 C) 4 D) 6

82) 82) _____

Phone calls (per day)	Frequency
8-11	37
12-15	49
16-19	17
20-23	46
24-27	39

A) 18 B) 17 C) 16 D) 38 E) 19

83) 83) _____

Weight (in pounds)	Frequency
135-139	7
140-144	12
145-149	10
150-154	11
155-159	20

A) 151 B) 12 C) 147 D) 149

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

Provide an appropriate response.

84) What is the difference between using μ and $\bar{x}$ to represent a mean? 84) _____

85) Why do data entries need to be ordered before the median can be found? 85) _____

86) On a recent Statistics test, the scores were 15, 66, 66, 81, 82, 83, 85, 88, 90, 92, 93, and 95. Is the mean a good representation of the center of data? If not, why? 86) _____

87) On a recent Statistics test, the scores were 15, 66, 66, 81, 82, 83, 85, 88, 90, 92, 93, and 95. Is the mode a good representation of the center of data? If not, why? 87) _____

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

88) On a recent Statistics test, the scores were 61, 66, 68 , 82, 84, 86, 88, 90, 92, and 97. Find the 10% trimmed mean of this data. 88) _____

A) 77 B) 38.5 C) 85 D) 82

89) The lengths of phone calls from one household (in minutes) were 2, 4, 6, 7, and 10 minutes. Find the midrange for this data. 89) _____

A) 6 minutes B) 7 minutes C) 10 minutes D) 2 minutes

90) The cost of five homes in a certain area is given. 90) _____

$141,000 $149,000 $169,000 $139,000 $1,219,000

Which measure of central tendency should be used?

A) mode B) median C) mean D) midrange

91) The cost of five homes in a certain area is given. 91) _____

$186,000 $194,000 $214,000 $184,000 $1,264,000

List any outlier(s).

A) $1,264,000 B) $1,264,000 and $186,000
C) $186,000 D) There are no outliers.

92) The cost of five homes in a certain area is given. 92) _____

$206,000 $214,000 $234,000 $204,000 $1,284,000

Calculate the midrange.

A) $540,000 B) $1,080,000 C) $428,400 D) $214,000

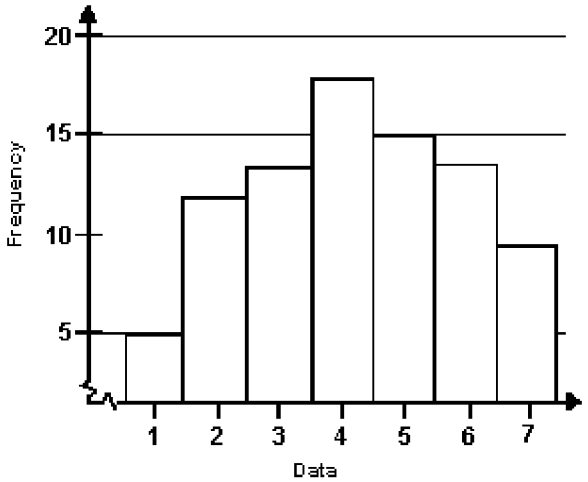
93) For the stem-and-leaf plot below, find the range of the data set. 93) _____

Key: 2|7 = 27

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

A) 43 B) 29 C) 37 D) 14

94) Find the range of the data set represented by the graph. 94) _____



A) 6 B) 5 C) 20 D) 17

95) The grade point averages for 10 students are listed below. Find the range of the data set. 95) _____

2.0 3.2 1.8 2.9 0.9 4.0 3.3 2.9 3.6 0.8

A) 2.8 B) 2.45 C) 1.4 D) 3.2

96) The heights (in inches) of 20 adult males are listed below. Find the range of the data set. 96) _____

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

A) 6.5 B) 7 C) 6 D) 5

97) Find the sample standard deviation. 97) _____

2 6 15 9 11 22 1 4 8 19

A) 6.3 B) 6.8 C) 2.1 D) 7.1

98) Find the sample standard deviation. 98) _____

15 42 53 7 9 12 14 28 47

A) 29.1 B) 15.8 C) 17.8 D) 16.6

99) Find the sample standard deviation. 99) _____

22 29 21 24 27 28 25 36

A) 2.8 B) 1.6 C) 4.8 D) 4.2

100) The heights (in inches) of 10 adult males are listed below. Find the sample standard deviation of the data set. 100) _____

70 72 71 70 69 73 69 68 70 71

A) 70 B) 3 C) 1.49 D) 2.38

101) Sample annual salaries (in thousands of dollars) for public elementary school teachers are listed. Find the sample standard deviation. 101) _____

17.0 10.7 38.7 32.1 16.4 15.9

A) 35.40 B) 10.97 C) 2851.44 D) 3453.36

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

102) The heights (in inches) of all 10 adult males in an office are listed below. Find the population standard deviation and the population variance. 102) _____

70 72 71 70 69 73 69 68 70 71

103) In a random sample, 10 students were asked to compute the distance they travel one way to school to the nearest tenth of a mile. The data is listed below. Compute the range, standard deviation and variance of the data. 103) _____

1.1 5.2 3.6 5.0 4.8 1.8 2.2 5.2 1.5 0.8

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

104) Without performing any calculations, use the stem-and-leaf plots to determine which statement is accurate. 104) _____

(i)

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

(ii)

10	9
11	5 8
12	3 3 7 7
13	2 5
14	1

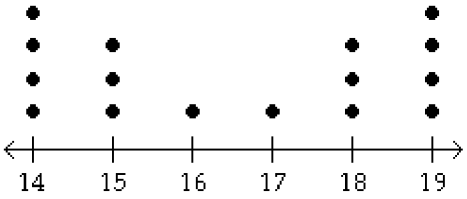
(iii)

0	
1	5
2	3 3 3 3 7 7 7 7
3	5
4	

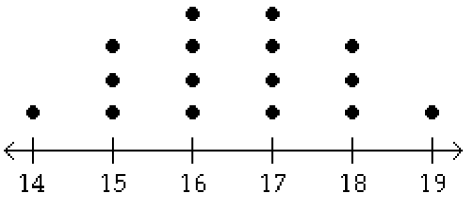
A) Data set (ii) has the greatest standard deviation.
B) Data sets (i) and (iii) have the same range.
C) Data sets (i) and (ii) have the same standard deviation.
D) Data set (i) has the smallest standard deviation.

105) You are asked to compare three data sets. Without calculating, determine which data set has the greatest sample standard deviation and which has the least sample standard deviation. 105) _____

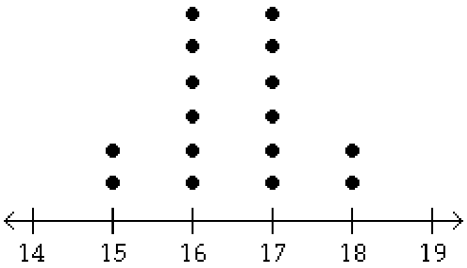
(i)



(ii)



(iii)



A) Greatest sample standard deviation: (iii)
Least sample standard deviation: (i)

B) Greatest sample standard deviation: (i)
Least sample standard deviation: (ii)

C) Greatest sample standard deviation: (i)
Least sample standard deviation: (iii)

D) Greatest sample standard deviation: (iii)
Least sample standard deviation: (ii)

106) You are asked to compare three data sets. Without calculating, determine which data set has the greatest sample standard deviation and which has the least sample standard deviation. 106) _____

(i)

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

(ii)

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

(iii)

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

A) Greatest sample standard deviation: (iii)
Least sample standard deviation: (ii)

B) Greatest sample standard deviation: (i)
Least sample standard deviation: (iii)

C) Greatest sample standard deviation: (i)
Least sample standard deviation: (ii)

D) Greatest sample standard deviation: (iii)
Least sample standard deviation: (i)

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

107) You need to purchase a battery for your car. There are two types available. Type A has a mean life of five years and a standard deviation of one year. Type B has a mean life of five years and a standard deviation of one month. Both batteries cost the same. Which one should you purchase if you are concerned that your car will always start? Explain your reasoning. 107) _____

108) Here are the batting averages of Sammy Sosa and Barry Bonds for 13 recent years. Which player is more consistent? Explain your reasoning. 108) _____

Sammy Sosa	0.203	0.260	0.261							
Barry Bonds	0.292	0.311	0.336							
0.300	0.268	0.273	0.251	0.308	0.288	0.320	0.328	0.288	0.279	
0.312	0.294	0.308	0.291	0.303	0.262	0.306	0.328	0.370	0.341	

109) You are the maintenance engineer for a local high school. You must purchase fluorescent light bulbs for the classrooms. Should you choose Type A with μ = 3000 hours and σ = 200 hours, or Type B with μ = 3000 hours and σ = 250 hours? 109) _____

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

110) The mean IQ score of adults is 100, with a standard deviation of 15. Use the Empirical Rule to find the percentage of adults with scores between 70 and 130. (Assume the data set has a bell-shaped distribution.) 110) _____
A) 100% B) 68% C) 95% D) 99.7%

111) The mean score of a placement exam for entrance into a math class is 80, with a standard deviation of 10. Use the Empirical Rule to find the percentage of scores that lie between 60 and 80. (Assume the data set has a bell-shaped distribution.) 111) _____
A) 34% B) 68% C) 95% D) 47.5%

112) The mean IQ score of students in a particular calculus class is 110, with a standard deviation of 5. Use the Empirical Rule to find the percentage of students with an IQ above 120. (Assume the data set has a bell-shaped distribution.) 112) _____
A) 11.15% B) 2.5% C) 15.85% D) 13.5%

113) The mean score of a competency test is 65, with a standard deviation of 4. Use the Empirical Rule to find the percentage of scores between 53 and 77. (Assume the data set has a bell-shaped distribution.) 113) _____
A) 68% B) 99.7% C) 50% D) 95%

114) The mean score of a competency test is 82, with a standard deviation of 2. Between what two values do about 99.7% of the values lie? (Assume the data set has a bell-shaped distribution.) 114) _____
A) Between 74 and 90 B) Between 78 and 86
C) Between 80 and 84 D) Between 76 and 88

115) The mean length of a human pregnancy is 266 days, with a standard deviation of 9 days. Use the Empirical Rule to determine the percentage of women whose pregnancies are between 257 and 275 days. (Assume the data set has a bell-shaped distribution.) 115) _____

A) 68% B) 99.7% C) 50% D) 95%

116) The mean SAT verbal score is 462, with a standard deviation of 98. Use the Empirical Rule to determine what percent of the scores lie between 462 and 560. (Assume the data set has a bell-shaped distribution.) 116) _____

A) 49.9% B) 47.5% C) 68% D) 34%

117) The mean SAT verbal score is 486, with a standard deviation of 95. Use the Empirical Rule to determine what percent of the scores lie between 391 and 486. (Assume the data set has a bell-shaped distribution.) 117) _____

A) 34% B) 49.9% C) 47.5% D) 68%

118) The mean SAT verbal score is 500, with a standard deviation of 100. Use the Empirical Rule to determine what percent of the scores lie between 500 and 700. (Assume the data set has a bell-shaped distribution.) 118) _____

A) 34% B) 49.9% C) 47.5% D) 68%

119) The mean SAT verbal score is 490, with a standard deviation of 96. Use the Empirical Rule to determine what percent of the scores lie between 298 and 586. (Assume the data set has a bell-shaped distribution.) 119) _____

A) 68% B) 83.9% C) 81.5% D) 34%

120) The mean monthly rent for a sample of studio apartments in one city is $1200 with a standard deviation of $210. The monthly rents for eight more studio apartments in the city are listed. Using the sample statistics above, determine which of the data values are unusual. Are any of the data values very unusual? Explain. (Assume the data set has a bell-shaped distribution.) 120) _____

$1074, $1536, $1641, $528, $801, $1662, $1347, $696

A) $528 is unusual because it is more than 3 standard deviations from the mean. There are no values that are very unusual because no value is more than 4 standard deviations from the mean.

B) $1641, $528, $1662, $696 are unusual because they are more than 2 standard deviations from the mean. $528 is very unusual because it is more than 3 standard deviations from the mean.

C) $1641, $528, $801, $1662, $696 are unusual because they are more than 2 standard deviations from the mean. $528 and $696 are very unusual because they are more than 3 standard deviations from the mean.

D) $1536, $1641, $528, $801, $1662, $696 are unusual because they are more than 1 standard deviation from the mean. $1641, $528, $1662, $696 are very unusual because they are more than 2 standard deviations from the mean.

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

121) Heights of adult women have a mean of 63.6 in. and a standard deviation of 2.5 in. Does Chebyshev's Theorem say about the percentage of women with heights between 58.6 in. and 68.6 in.? 121) _____

122) Heights of adult women have a mean of 63.6 in. and a standard deviation of 2.5 in. Apply Chebyshev's Theorem to the data using k = 3. Interpret the results. 122) _____

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

Use the grouped data formulas to find the indicated mean or standard deviation.

123) The salaries of a random sample of a company's employees are summarized in the frequency distribution below. Approximate the sample mean. 123) _____

Salary ($)	Employees
5,001-10,000	16
10,001-15,000	14
15,001-20,000	11
20,001-25,000	16
25,001-30,000	23

A) $18,500.50 B) $17,500 C) $16,650.45 D) $20,350.55

124) The speeds of a random sample of 100 cars are recorded as they pass a highway checkpoint. The results are summarized in the frequency distribution below. Approximate the sample mean. 124) _____

Speed (mph)	Cars
30-39	3
40-49	17
50-59	50
60-69	19
70-79	11

A) 59.1 mph B) 54.5 mph C) 61.9 mph D) 56.3 mph

125) The manager of a bank recorded the amount of time a random sample of customers spent waiting in line during peak business hours one Monday. The frequency distribution below summarizes the results. Approximate the sample mean. Round your answer to one decimal place. 125) _____

Waiting time (minutes)	Number of customers
0 - 3	12
4 - 7	14
8 - 11	13
12 - 15	6
16 - 19	8
20 - 23	2
24 - 27	1

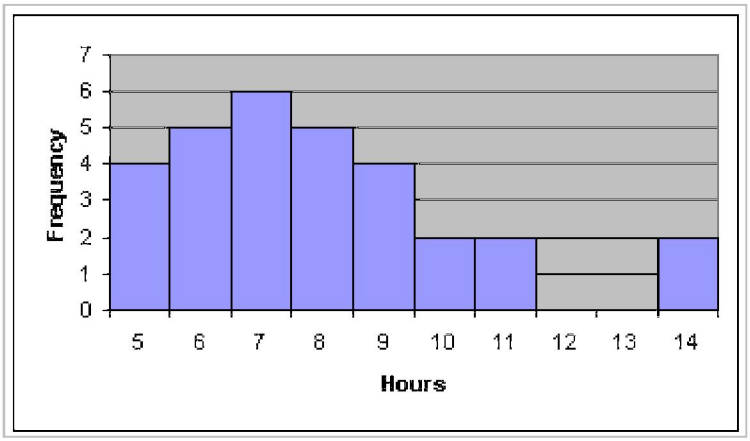
A) 13.5 min B) 8.0 min C) 9.1 min D) 9.2 min

126) The heights of a random sample of professional basketball players are summarized in the frequency distribution below. Approximate the sample mean. Round your answer to one decimal place. 126) _____

Height (in.)	Frequency
70 - 71	1
72 - 73	6
74 - 75	8
76 - 77	12
78 - 79	9
80 - 81	5
82 - 83	2

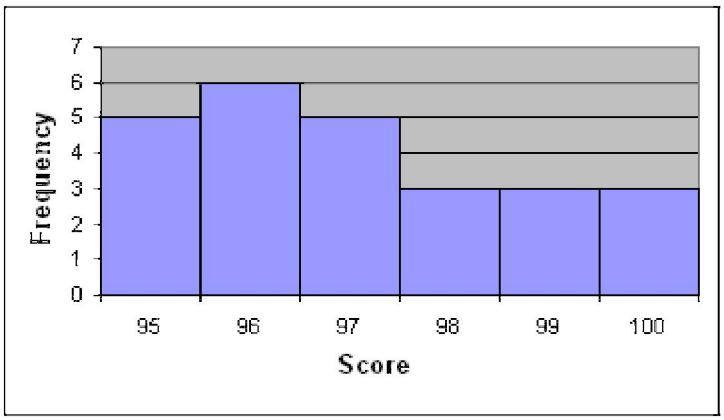
A) 78.4 in. B) 74.9 in. C) 13.5 in. D) 76.6 in.

127) A random sample of 30 high school students is selected. Each student is asked how many hours he or she spent on the Internet during the previous week. The results are shown in the histogram. Estimate the sample mean. 127) _____



A) 7.9 hr B) 8.3 hr C) 7.7 hr D) 8.1 hr

128) A random sample of 25 community service projects is selected and the scores are recorded. The results are shown in the histogram. Estimate the sample mean. 128) _____



A) 96.9 B) 96.7 C) 97.3 D) 97.1

129) For the following data set, approximate the sample standard deviation. 129) _____

Miles (per day)	Frequency
1-2	9
3-4	22
5-6	28
7-8	15
9-10	4

A) 5.1 B) 2.9 C) 1.6 D) 2.1

130) For the following data set, approximate the sample standard deviation. 130) _____

Phone calls (per day)	Frequency
8-11	18
12-15	23
16-19	38
20-23	47
24-27	32

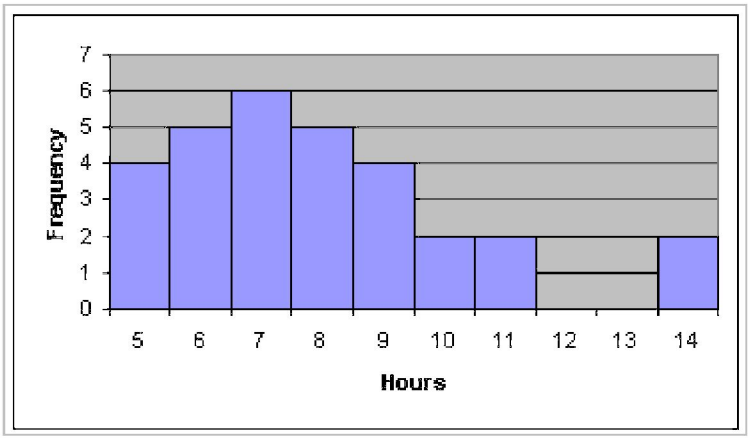
A) 18.8 B) 5.1 C) 2.9 D) 3.2

131) For the following data set, approximate the sample standard deviation. 131) _____

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

A) 0.98 B) 3.85 C) 2.57 D) 1.86

132) A random sample of 30 high school students is selected. Each student is asked how many hours he or she spent on the Internet during the previous week. The results are shown in the histogram. Estimate the sample standard deviation. 132) _____



A) 2.6 hr B) 2.2 hr C) 2.4 hr D) 2.0 hr

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

Provide an appropriate response.

133) For the data below, find Pearson's index of skewness. The data set: The systolic blood pressures of 20 randomly selected patients at a blood bank. 133) _____

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

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

134) In a random sample, 10 students were asked to compute the distance they travel one way to school to the nearest tenth of a mile. The data is listed below. 134) _____

a) If a constant value k is added to each value, how will the standard deviation be affected?

b) If each value is multiplied by a constant k, how will the standard deviation be affected?

1.1 5.2 3.6 5.0 4.8 1.8 2.2 5.2 1.5 0.8

A) The standard deviation will not be affected.
B) The standard deviation will be multiplied by the constant k.

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

135) In a random sample, 10 students were asked to compute the distance they travel one way to school to the nearest tenth of a mile. The data is listed below. Compute the coefficient of variation. 135) _____

1.1 5.2 3.6 5.0 4.8 1.8 2.2 5.2 1.5 0.8

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

Find the coefficient of variation for each of the two sets of data, then compare the variation. Round results to one decimal place.

136) Listed below are the systolic blood pressures (in mm Hg) for a sample of men aged 20-29 and for a sample of men aged 60-69. 136) _____

Men aged 20-29: 118 124 129 118 131 123
Men aged 60-69: 131 151 137 125 164 139

A) Men aged 20-29: 4.2%
Men aged 60-69: 8.1%
There is substantially more variation in blood pressures of the men aged 60-69.

B) Men aged 20-29: 7.2%
Men aged 60-69: 4.6%
There is more variation in blood pressures of the men aged 20-29.

C) Men aged 20-29: 4.6%
Men aged 60-69: 10.5%
There is substantially more variation in blood pressures of the men aged 60-69.

D) Men aged 20-29: 4.4%
Men aged 60-69: 10.0 %
There is substantially more variation in blood pressures of the men aged 60-69.

137) The customer service department of a phone company is experimenting with two different systems. On Monday they try the first system which is based on an automated menu system. On Tuesday they try the second system in which each caller is immediately connected with a live agent. A quality control manager selects a sample of seven calls each day. He records the time for each customer to have his or her question answered. The times (in minutes) are listed below. 137) _____

Automated Menu: 11.2 7.2 4.0 2.9 9.2 6.3 5.5
Live agent: 6.3 2.5 4.8 4.1 3.4 5.2 3.7

A) Automated Menu: 43.7%
Live agent: 29.4%
There is substantially more variation in the times for the automated menu system.

B) Automated Menu: 46.9%
Live agent: 31.5%
There is substantially more variation in the times for the automated menu system.

C) Automated Menu: 24.3%
Live agent: 46.2%
There is substantially more variation in the times for the live agent.

D) Automated Menu: 45.3%
Live agent: 30.5%
There is substantially more variation in the times for the automated menu system.

138) Compare the variation in heights to the variation in weights of thirteen-year old girls. The heights (in inches) and weights (in pounds) of nine randomly selected thirteen-year old girls are listed below. 138) _____

Heights (inches):	59.3	61.2	62.6	64.7	60.1	58.3	64.6	63.7	66.1
Weights (pounds):	86	97	93	119	96	90	123	98	139

A) Heights: 4.3%
Weights: 17.2%
There is substantially more variation in the weights than in the heights of the girls.

B) Heights: 3.9%
Weights: 15.4%
There is substantially more variation in the weights than in the heights of the girls.

C) Heights: 4.1%
Weights: 16.4%
There is substantially more variation in the weights than in the heights of the girls.

D) Heights: 11.5%
Weights: 6.5%
There is substantially more variation in the heights than in the weights of the girls.

Provide an appropriate response.

139) The test scores of 30 students are listed below. Find the five-number summary. 139) _____

31	41	45	48	52	55	56	58	63	65
67	67	69	70	70	74	75	78	79	79
80	81	83	85	85	87	90	92	95	99

A) Min = 31, Q_1 = 58, Q_2 = 72, Q_3 = 83, Max = 99

B) Min = 31, Q_1 = 57, Q_2 = 70, Q_3 = 81, Max = 99

C) Min = 31, Q_1 = 58, Q_2 = 70, Q_3 = 83, Max = 99

D) Min = 31, Q_1 = 57, Q_2 = 72, Q_3 = 81, Max = 99

140) The weights (in pounds) of 30 preschool children are listed below. Find the five-number summary. 140) _____

25	25	26	26.5	27	27	27.5	28	28	28.5
29	29	30	30	30.5	31	31	32	32.5	32.5
33	33	34	34.5	35	35	37	37	38	38

A) Min = 25, Q_1 = 28, Q_2 = 30.75, Q_3 = 34, Max = 38

B) Min = 25, Q_1 = 28, Q_2 = 30.5, Q_3 = 34, Max = 38

C) Min = 25, Q_1 = 27.5, Q_2 = 30.5, Q_3 = 33.5, Max = 38

D) Min = 25, Q_1 = 27.5, Q_2 = 30.75, Q_3 = 33, Max = 38

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

141) The weights (in pounds) of 30 preschool children are listed below. Find the interquartile range of the 30 weights listed below. What can you conclude from the result? 141) _____

25	25	26	26.5	27	27	27.5	28	28	28.5
29	29	30	30	30.5	31	31	32	32.5	32.5
33	33	34	34.5	35	35	37	37	38	38

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

142) The cholesterol levels (in milligrams per deciliter) of 30 adults are listed below. Find the interquartile range for the cholesterol level of the 30 adults. 142) _____

154	156	165	165	170	171	172	180	184	185
189	189	190	192	195	198	198	200	200	200
205	205	211	215	220	220	225	238	255	265

A) 180 B) 211 C) 30 D) 31

143) The cholesterol levels (in milligrams per deciliter) of 30 adults are listed below. Find Q_1. 143) _____

154	156	165	165	170	171	172	180	184	185
189	189	190	192	195	198	198	200	200	200
205	205	211	215	220	220	225	238	255	265

A) 180 B) 200 C) 171 D) 184.5

144) Use the data to identify any outliers. 144) _____

35	40	54	65	67
69	71	73	74	76
80	82	87	90	99

A) 35, 40 B) 35 C) 35, 99 D) None

145) Use the data to identify any outliers. 145) _____

16	25	1	33	15
5	18	8	20	14
17	19	16	10	21
28	14	37	18	

A) 1, 37 B) 1, 33, 37 C) 33, 37 D) None

146) Use the data to identify any outliers. 146) _____

15	18	18	19	22	23	24
24	24	24	25	26	26	27
28	28	30	32	33	40	42

A) 15, 42 B) 42 C) 40, 42 D) None

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

147) The test scores of 30 students are listed below. Draw a box-and-whisker plot that represents the data. 147) _____

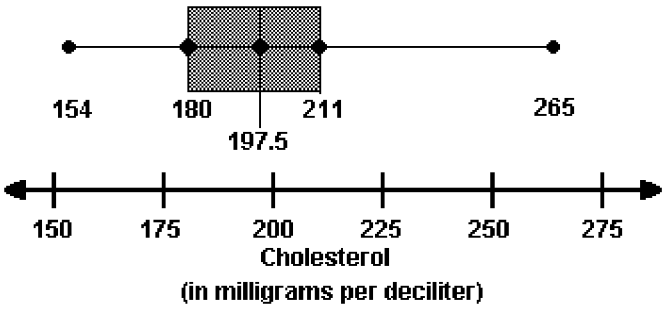
31	41	45	48	52	55	56	56	63	65
67	67	69	70	70	74	75	78	79	79
80	81	83	85	85	87	90	92	95	99

148) The cholesterol levels (in milligrams per deciliter) of 30 adults are listed below. Draw a box-and-whisker plot that represents the data. 148) _____

154	156	165	165	170	171	172	180	184	185
189	189	190	192	195	198	198	200	200	200
205	205	211	215	220	220	225	238	255	265

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

149) Use the box-and-whisker plot below to determine which statement is accurate. 149) _____

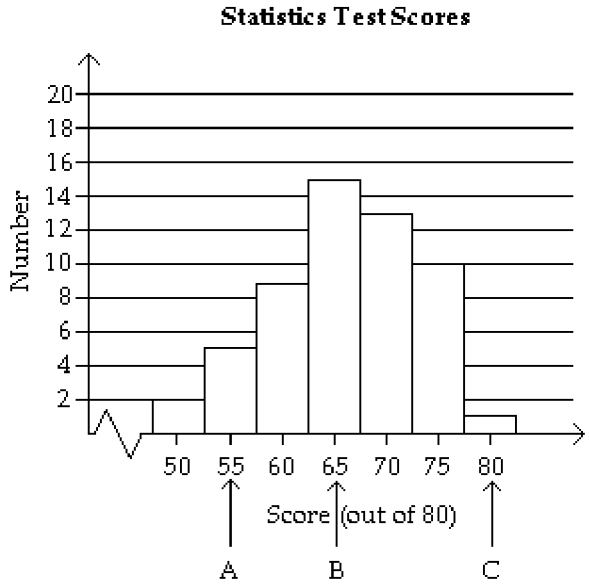


A) About 25% of the adults have cholesterol levels of at most 211.
B) About 75% of the adults have cholesterol levels less than 180.
C) One half of the cholesterol levels are between 180 and 197.5.
D) One half of the cholesterol levels are between 180 and 211.

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

150) The midpoints A, B, and C are marked on the histogram. Without calculating, match them with the indicated z-scores. Which z-scores, if any, would be considered unusual? 150) _____

z = 0
z = -1.33
z = 2.01



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

151) Find the z-score for the value 62, when the mean is 79 and the standard deviation is 4. 151) _____
A) z = -4.25 B) z = 0.73 C) z = -0.73 D) z = -4.50

152) Many firms use on-the-job training to teach their employees computer programming. Suppose you work in the personnel department of a firm that just finished training a group of its employees to program, and you have been requested to review the performance of one of the trainees on the final test that was given to all trainees. The mean and standard deviation of the test scores are 81 and 3, respectively, and the distribution of scores is bell-shaped and symmetric. Suppose the trainee in question received a score of 77. Compute the trainee's z-score. 152) _____
A) z = -0.91 B) z = -1.33 C) z = 1.33 D) z = 0.91

153) A radio station claims that the amount of advertising per hour of broadcast time has an average of 17 minutes and a standard deviation equal to 2.7 minutes. You listen to the radio station for 1 hour, at a randomly selected time, and carefully observe that the amount of advertising time is equal to 11 minutes. Calculate the z-score for this amount of advertising time. 153) _____
A) z = 2.22 B) z = -0.49 C) z = -2.22 D) z = 0.49

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

154) Test scores for a history class had a mean of 79 with a standard deviation of 4.5. Test scores for a physics class had a mean of 69 with a standard deviation of 3.7. Suppose a student gets a 65 on the history test and a 74 on the physics test. Calculate the z-score for each test. On which test did the student perform better? 154) _____

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

155) For the mathematics part of the SAT the mean is 514 with a standard deviation of 113, and for the mathematics part of the ACT the mean is 20.6 with a standard deviation of 5.1. Bob scores a 660 on the SAT and a 27 on the ACT. Use z-scores to determine on which test he performed better. 155) _____

A) SAT B) ACT

156) The birth weights for twins are normally distributed with a mean of 2353 grams and a standard deviation of 647 grams. Use z-scores to determine which birth weight could be considered unusual. 156) _____

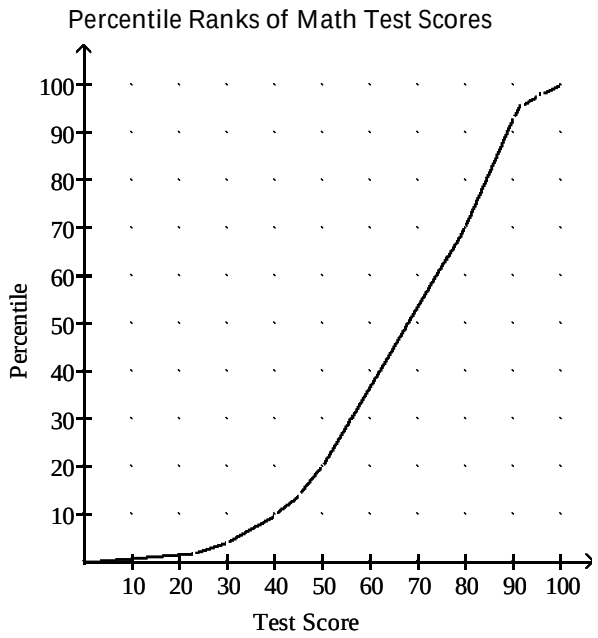
A) 2353 g B) 3647 g C) 2000 g D) 1200 g

157) The ages of 10 grooms at their first marriage are listed below. Find the midquartile. 157) _____

35.1 24.3 46.6 41.6 32.9 26.8 39.8 21.5 45.7 33.9

A) 34.5 B) 34.1 C) 34.2 D) 43.7

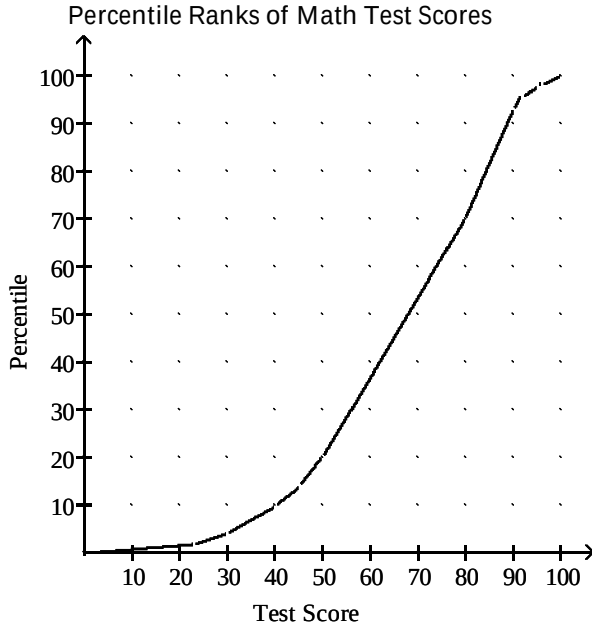
158) The graph below is an ogive of scores on a math test. 158) _____



Use the graph to approximate the percentile rank of an individual whose test score is 70.

A) 53 B) 75 C) 80 D) 58

159) The graph below is an ogive of scores on a math test. 159) _____



Use the graph to approximate the test score that corresponds to the 10th percentile?

A) 6 B) 1 C) 34 D) 40

160) The cholesterol levels (in milligrams per deciliter) of 30 adults are listed below. Find the percentile that corresponds to a cholesterol level of 238 milligrams per deciliter. 160) _____

154	156	165	165	170	171	172	180	184	185
189	189	190	192	195	198	198	200	200	200
205	205	211	215	220	220	225	238	255	265

A) 30th percentile B) 50th percentile C) 40th percentile D) 90th percentile

161) The test scores of 30 students are listed below. Find the percentile that corresponds to a score of 74. 161) _____

31	41	45	48	52	55	56	56	63	65
67	67	69	70	70	74	75	78	79	79
80	81	83	85	85	87	90	92	95	99

A) 50th percentile B) 30th percentile C) 40th percentile D) 90th percentile

162) The test scores of 30 students are listed below. Which test scores are above the 75th percentile? 162) _____

31	41	45	48	52	55	56	56	63	65
67	67	69	70	70	74	75	78	79	79
80	81	83	85	85	87	90	92	95	99

A) 87, 90, 92, 95, 99 B) 90, 92, 95, 99
C) 83, 85, 85, 87, 90, 92, 95, 99 D) 85, 85, 87, 90, 92, 95, 99

163) The weights (in pounds) of 30 preschool children are listed below. Which weights are below the 25th percentile? 163) _____

25	25	26	26.5	27	27	27.5	28	28	28.5
29	29	30	30	30.5	31	31	32	32.5	32.5
33	33	34	34.5	35	35	37	37	38	38

A) 25, 25, 26, 26.5, 27, 27
B) 25, 25, 26, 26.5
C) 25, 25, 26, 26.5, 27, 27, 27.5
D) 25, 25, 26, 26.5, 27, 27, 27.5, 28, 28

164) A teacher gives a 20-point quiz to 10 students. The scores are listed below. What percentile corresponds to the score of 12? 164) _____

20 8 10 7 15 16 12 19 14 9

A) 13
B) 12
C) 40
D) 25

165) In a data set with a minimum value of 54.5 and a maximum value of 98.6 with 300 observations, there are 186 points less than 81.2. Find the percentile for 81.2. 165) _____

A) 62
B) 71
C) 53
D) 68

166) The cholesterol levels (in milligrams per deciliter) of 30 adults are listed below. Find the percentile that corresponds to cholesterol level of 195. 166) _____

154	156	165	165	170	171	172	180	184	185
189	189	190	192	195	198	198	200	200	200
205	205	211	215	220	220	225	238	255	265

A) 50
B) 12
C) 58
D) 33

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

167) A student's score on the SAT-1 placement test for U.S. history is in the 90th percentile. What can you conclude about the student's test score? 167) _____

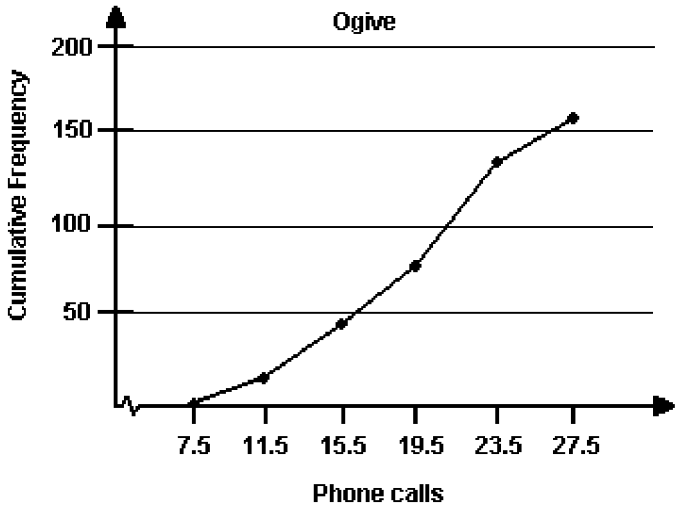
Answer Key
Testname: UNTITLED2

1) A
2) D
3) C
4) D
5) Class width = 5, Lower class limits: 1, 6, 11, 16, 21, 26; Upper class limits: 5, 10, 15, 20, 25, 30
6) Class width = 31, Lower class limits: 80, 111, 142, 173, 204, 235; Upper class limits: 110, 141, 172, 203, 234, 265
7) D
8) A
9) a) Class with greatest relative frequency: 105-115 mm Hg
Class with least relative frequency: 145-155 mm Hg
b) Greatest relative frequency ≈ 0.35
Least relative frequency ≈ 0.03
c) Approximately 0.08
10)

11)

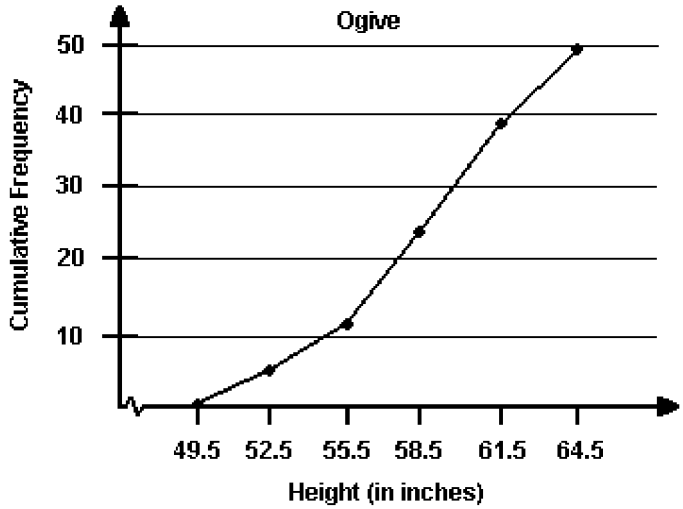
12) **Phone Calls (per day)**

Class	Frequency, f	Cumulative frequency
8 - 11	18	18
12 - 15	23	41
16 - 19	38	79
20 - 23	47	126
24 - 27	32	158



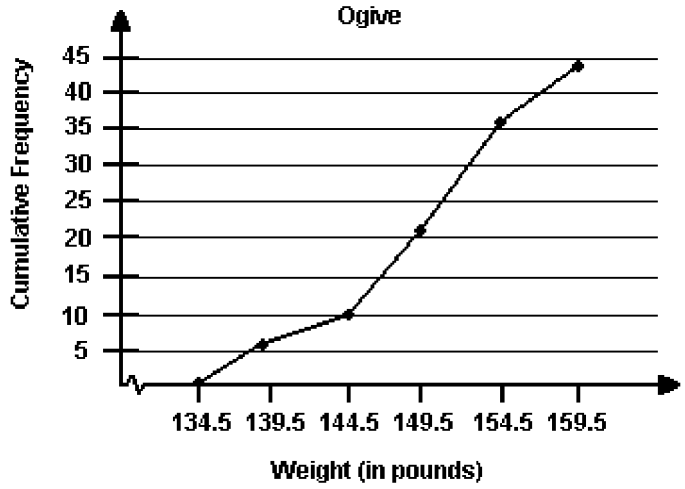
13) **Height (in inches)**

Class	Frequency, f	Cumulative frequency
50 - 52	5	5
53 - 55	8	13
56 - 58	12	25
59 - 61	13	38
62 - 64	11	49



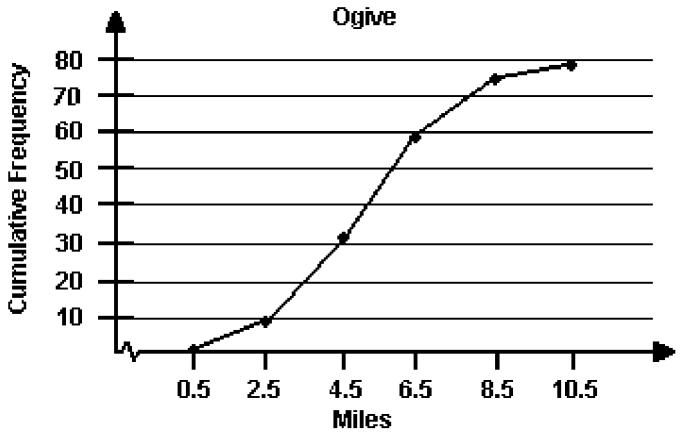
14) **Weight (in pounds)**

Class	Frequency, f	Cumulative frequency
135 - 139	6	6
140 - 144	4	10
145 - 149	11	21
150 - 154	15	36
155 - 159	8	44



15) **Miles (per day)**

Class	Frequency, f	Cumulative frequency
1 - 2	9	9
3 - 4	22	31
5 - 6	28	59
7 - 8	15	74
9 - 10	4	78

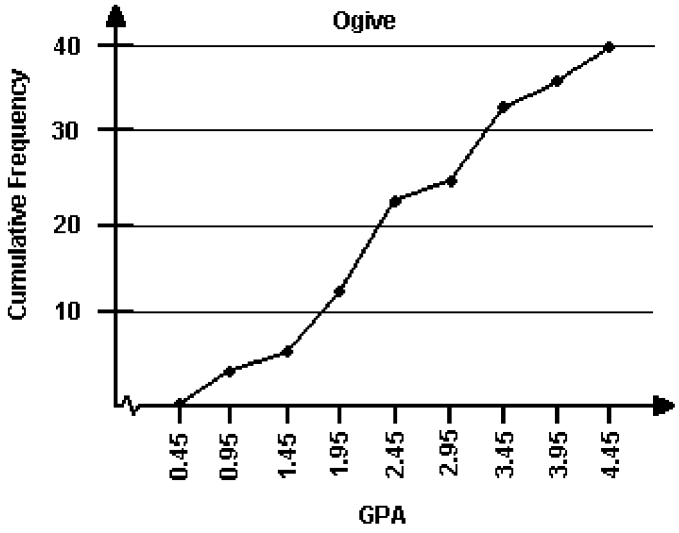


16) C
17) B
18)

GPA	Frequency	Midpoint	Relative Frequency	Cumulative Frequency
0.5-0.9	4	0.7	0.10	4
1.0-1.4	2	1.2	0.05	6
1.5-1.9	7	1.7	0.175	13
2.0-2.4	9	2.2	0.225	22
2.5-2.9	2	2.7	0.05	24
3.0-3.4	10	3.2	0.25	34
3.5-3.9	2	3.7	0.05	36
4.0-4.4	4	4.2	0.10	40

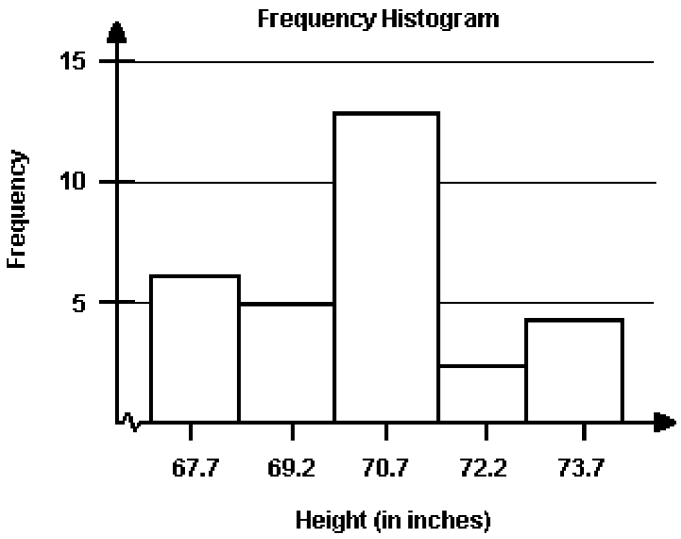
19)

20)


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

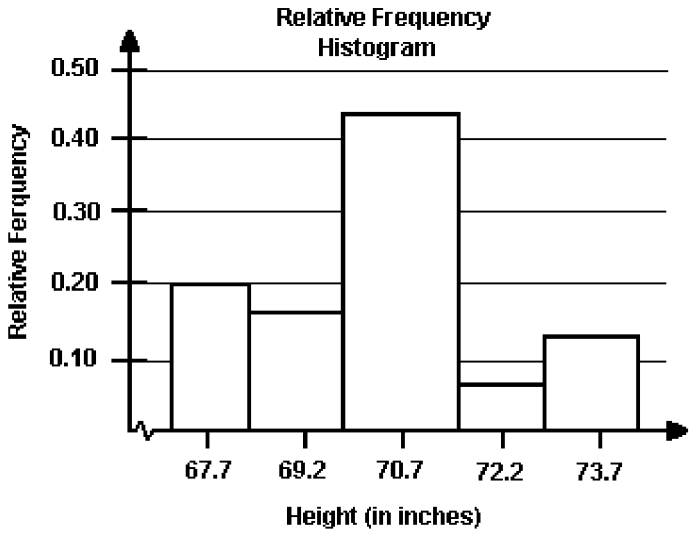
21)

Height (in inches)	Frequency	Relative Frequency	Cumulative Frequency
67.0-68.4	6	0.20	6
68.5-69.9	5	0.167	11
70.0-71.4	13	0.433	24
71.5-72.9	2	0.067	26
73.0-74.4	4	0.133	30

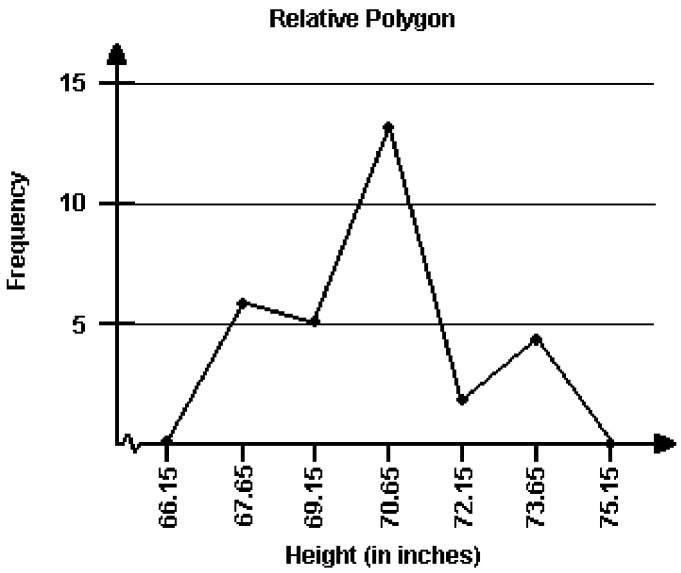


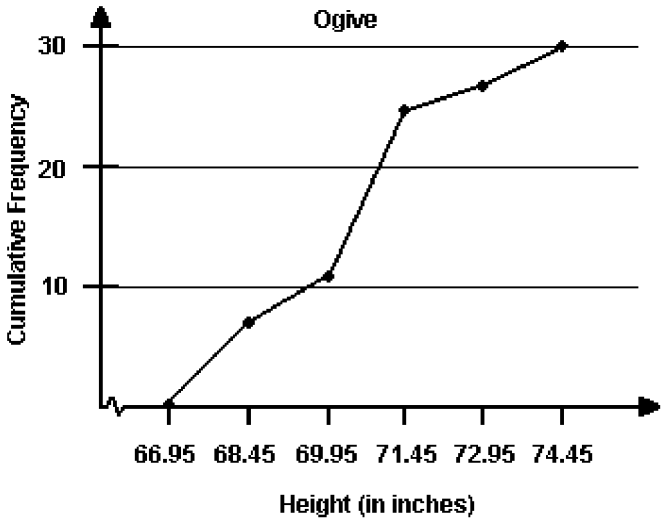
22)

23)



24)





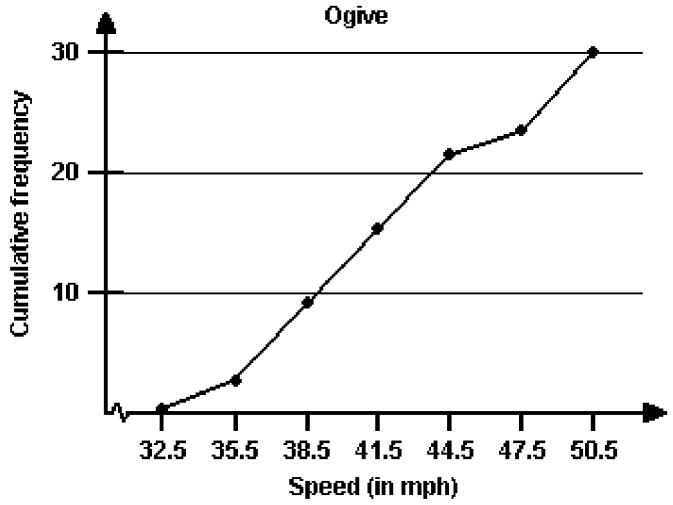
25)

26)

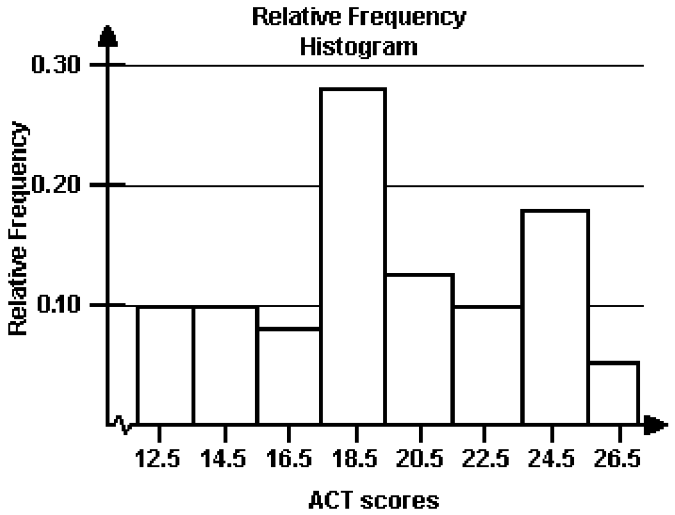
Speed (in mph)	Frequency	Relative Frequency	Cumulative Frequency
33-35	3	0.10	3
36-38	6	0.20	9
39-41	6	0.20	15
42-44	6	0.20	21
45-47	3	0.10	24
48-50	6	0.20	30

27)

28)


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

29) a) See graph below
b) The minimum score = 14
c) The university will accept 76.57% of the applicants.



30) Class limits determine which numbers can belong to that class. Class boundaries are the numbers that separate classes without forming gaps between them.
31) B
32) Key: 0 | 4 = 4

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

Most of these years he hit 36 or more home runs.
33) Key: 1| 6 = 16

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

Most of these years he hit between 33 and 49 home runs.
34) B
35) D

36) Key: 6 | 7 = 67

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

Most of these males had heights of 70 or more inches.

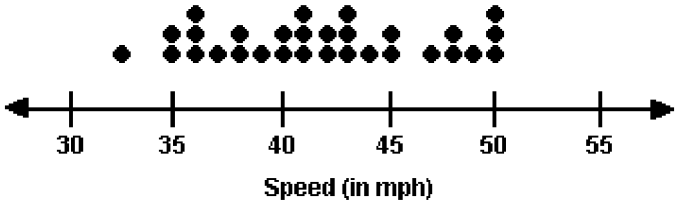
37) Key: 3 | 3 = 33

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

Most of the motorists were going 40 - 49 miles per hour.

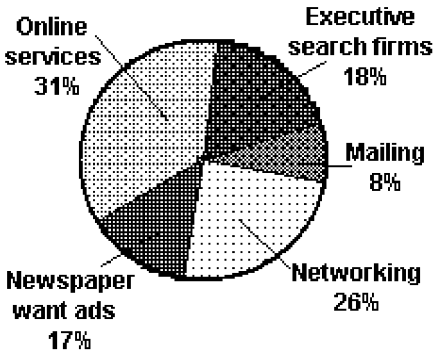
38) B

39)

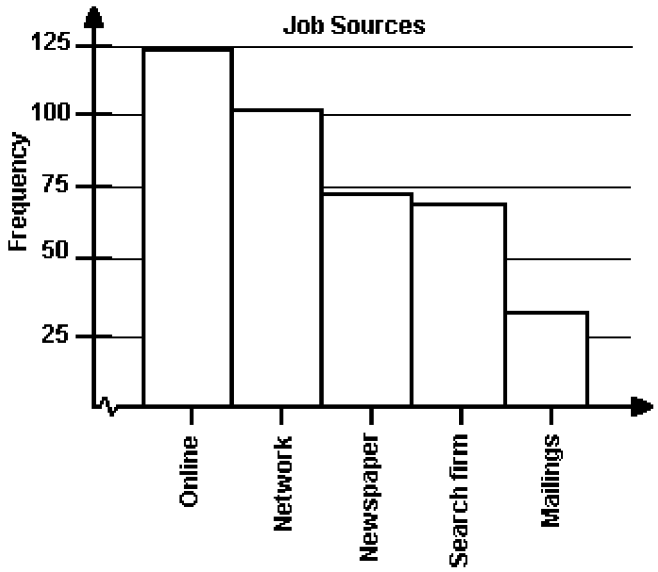


40)

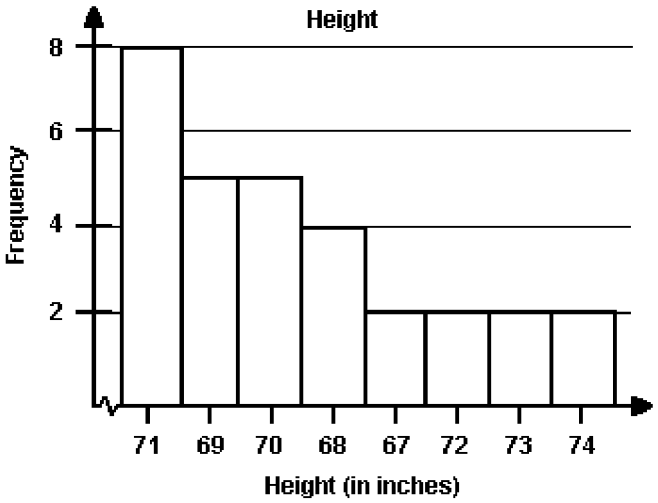
41)



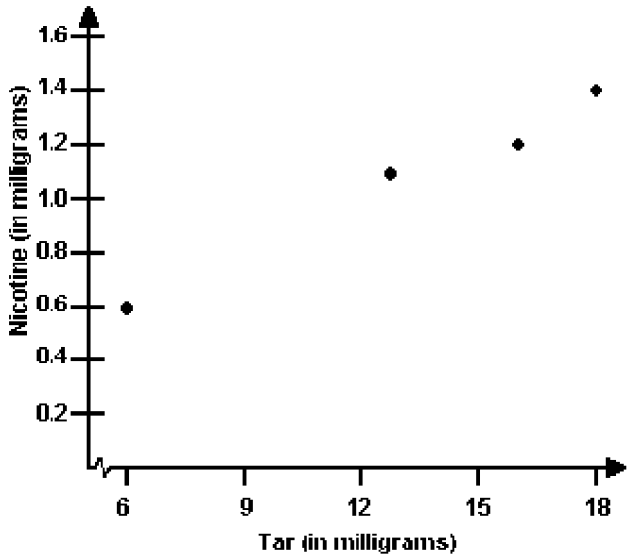
42)


Job Sources
Frequency
125
100
75
50
25
Online
Network
Newspaper
Search firm
Mailings

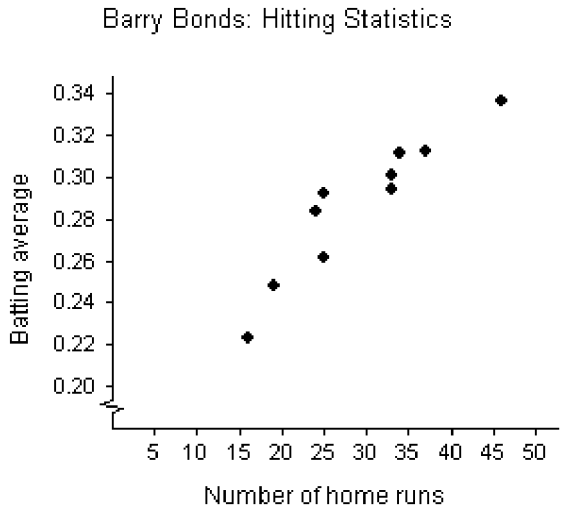
43)


Height
Frequency
8
6
4
2
71
69
70
68
67
72
73
74
Height (in inches)

44)

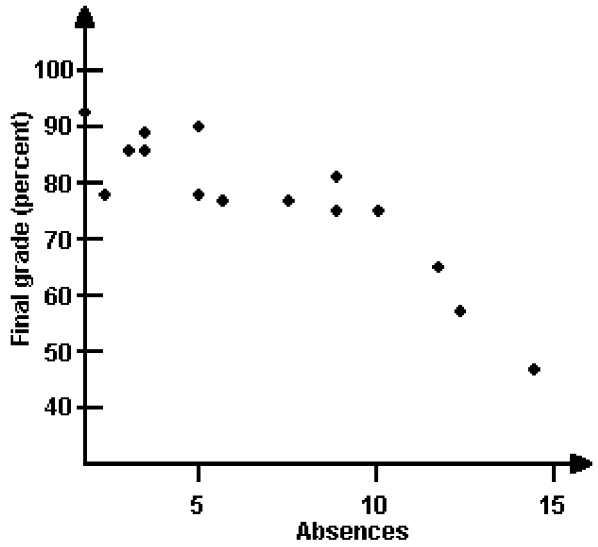


45)



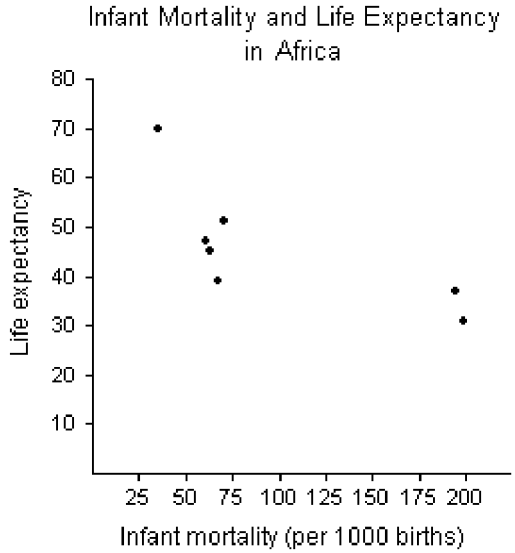
In general, there appears to be a relationship between the home runs and batting averages. As the number of home runs increased, the batting averages increased.

46)

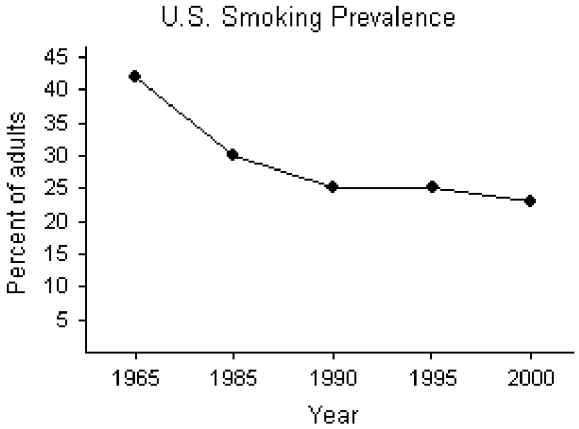


In general, there appears to be a relationship between the absences and the final grades. As the number of absences increased, the students' final grades decreased.

47)

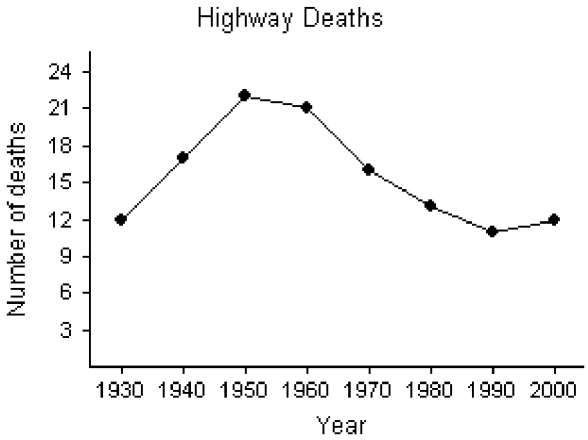


48)



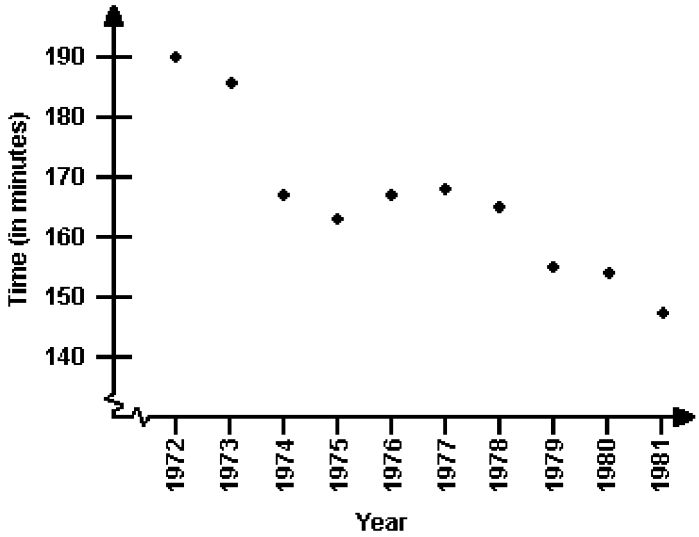
It appears the percent of U.S. adults who smoke is declining.

49)

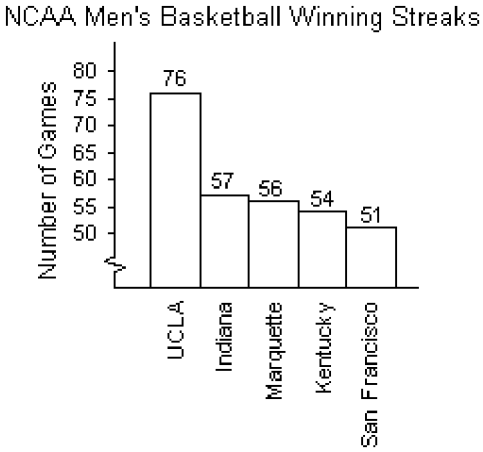


It appears the number of deaths peaked in 1950.

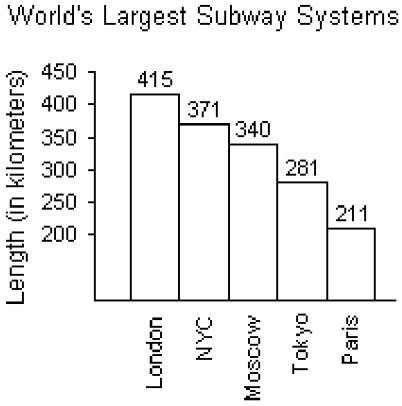
50)



51)



52)



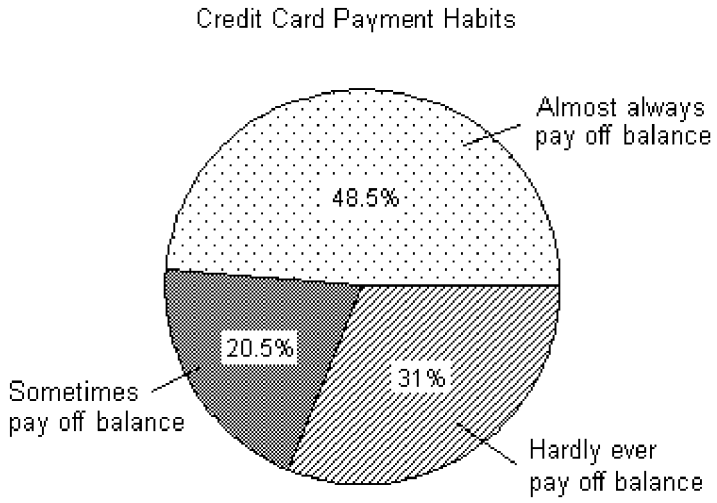
53) Key: 12 | 7 = 127

12	7
13	0 7 7
14	5 9
15	0 1
16	0 2 6 7 7
17	4
18	0 0
19	4
20	4 7
21	
22	1
23	
24	4
25	4
26	2
27	
28	7

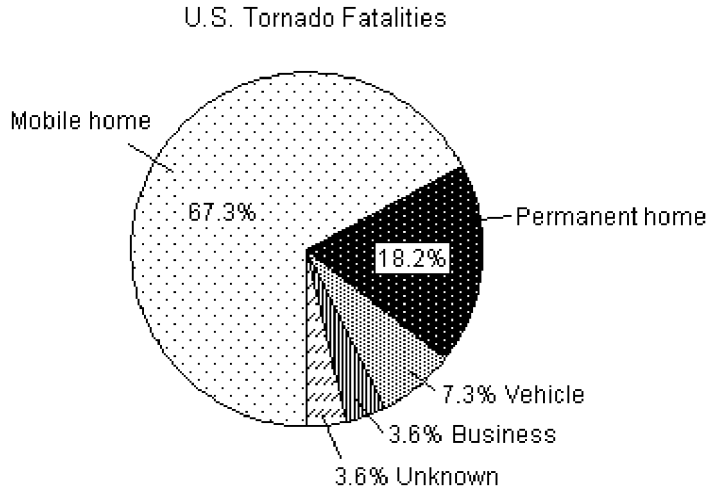
54) Key: 9 | 3 = 9.3

9	3 6 6 7 8
10	0 1 3 5 7
11	3 4 5 9
12	1 8 9
13	0 0
14	
15	7

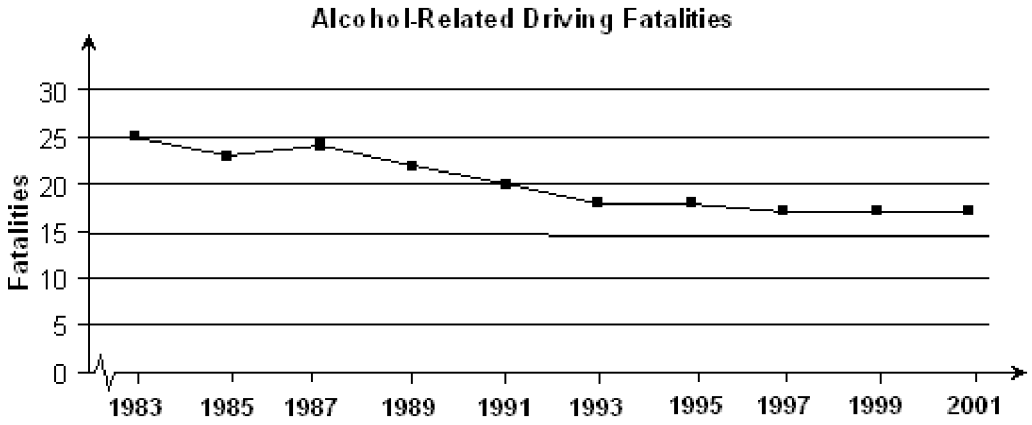
55)



56)



57)



It appears the number of alcohol-related fatalities is gradually declining.

58) The graph distorts the data because the the vertical scale starts at 60 rather than 0, giving the impression of a large difference in the number of accidents, when actually the number of accidents only varies from 90 to 120. To make the graph less misleading, change the vertical scale so that it begins at 0 and increases in increments of 20.

59) A

60) C

61) A

62) D

63) B

64) C

65) C

66) A

67) A

68) A

69) mean 63, median 64, mode 65

70) C

71) B

72) mean: 97; median 103

73) mean: 37; median: 35.5; The median best represents the data because the mean is affected by the outlier (73) which causes a gap in the distribution.

74) B

75) A

76) A

77) C

78) mean: $489,415; median: $265,664; The median represents the data better because the mean is affected by the outlier ($2,194,246) which causes a gap in the distribution.

79) B

80) B

81) A

82) A

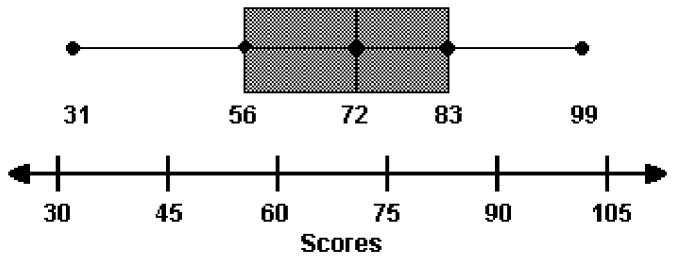
83) D

84) μ represents a population mean and $\bar{x}$ represents a sample mean.

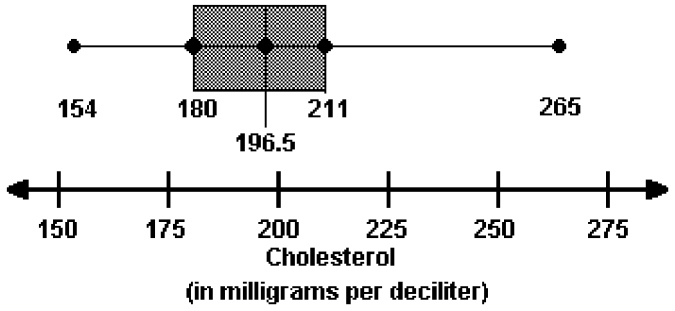
85) The median is found by calculating the mean of the two middle data entries. The middle entries cannot be found unless the data entries are first ordered.

86) No, the mean is not a good representation of the center. The mean score is 78, and 9 of the scores are better than this.
87) No, the mode is not a good representation of the center. The mode score is 66, and 9 of the scores are better than this.
88) D
89) A
90) B
91) A
92) A
93) B
94) A
95) D
96) B
97) D
98) C
99) C
100) C
101) B
102) $\sigma = 1.42$, $\sigma^2 = 2.01$
103) range = 4.4, s = 1.8, $s^2 = 3.324$
104) C
105) C
106) A
107) Battery Type B has less variation. As a result, it is less likely to fail before its mean life is up.
108) Sosa: $\bar{x} = 0.279$ and s = 0.033; Bonds: $\bar{x} = 0.312$ and s = 0.027.
Bonds is more consistent since his standard deviation is less.
109) The bulbs with the lower standard deviation are more consistent and it is easier to plan for their replacement.
110) C
111) D
112) B
113) B
114) D
115) A
116) D
117) A
118) C
119) C
120) B
121) At least 75% of the heights should fall between 58.6 in. and 68.6 in.
122) (56.1, 71.1) 89% of the heights are between 56.1 and 71.1 inches.
123) A
124) D
125) C
126) D
127) A
128) D
129) D
130) B
131) B
132) C
133) $\bar{x} = 121.7$, s = 11.82, P = 0.31. Since $-1 \le P \le 1$, there is no significant skewness.

134) A
135) coefficient of variation = $\frac{1.82}{3.12} \times 100\% = 58.3\%$
136) D
137) A
138) A
139) A
140) A
141) IQR = $Q_3 - Q_1 = 34 - 28 = 6$. This means that the weights of the middle half of the data set vary by 6 pounds.
142) D
143) A
144) A
145) B
146) C
147)



148)



149) D
150) A → z = -1.33
B → z = 0
C → z = 2.01
A z-score of 2.01 would be unusual.
151) A
152) B
153) C
154) history z-score = -3.11; physics z-score = 1.35; The student performed better on the physics test.
155) A
156) B
157) C
158) A
159) D
160) D

161) A
162) D
163) C
164) C
165) A
166) A
167) The student's score was higher than the scores of 90% of the students who took the test.