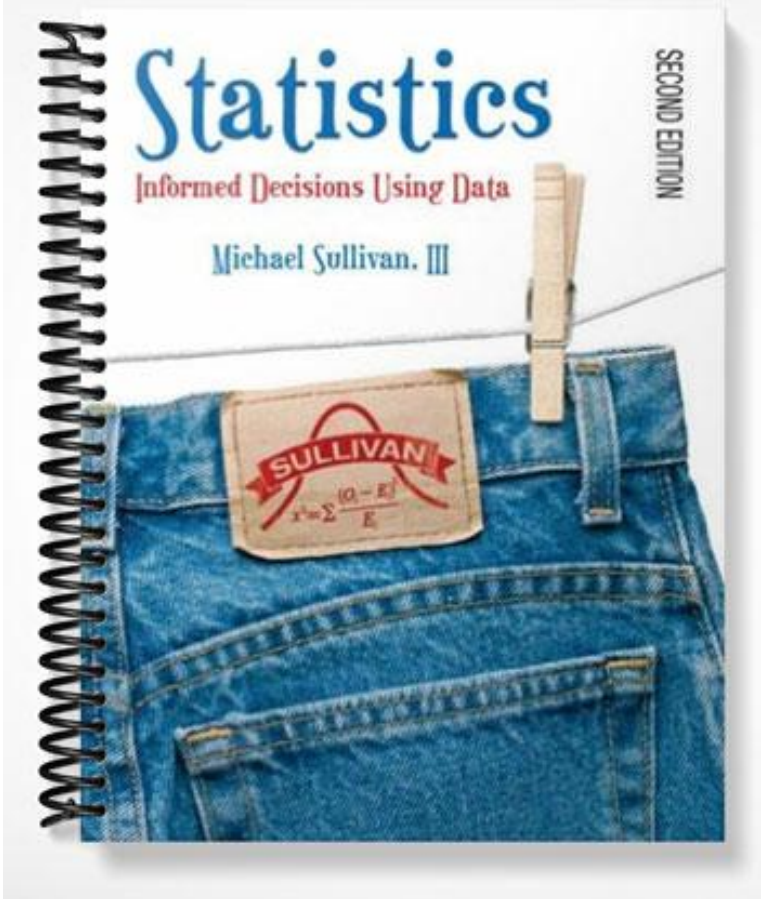
TEST BANK


Statistics
Informed Decisions Using Data
Michael Sullivan, III
SECOND EDITION
SULLIVAN

Ch. 2 Organizing and Summarizing Data

2.1 Organizing Qualitative Data

1 Organize Qualitative Data in Tables

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

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.

Class	Frequency
Large	345
Medium	830
Small	645

Construct a frequency table including relative frequencies and percentages.

2) The results of a survey about a recent judicial appointment are given in the table below.

Response	Frequency
Strongly Favor	21
Favor	30
Neutral	12
Oppose	13
Strongly Oppose	124

Construct a relative frequency distribution.

3) The preschool children at Elmwood Elementary School were asked to name their favorite color. The results are listed below.

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

Construct a frequency distribution and a relative frequency distribution.

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

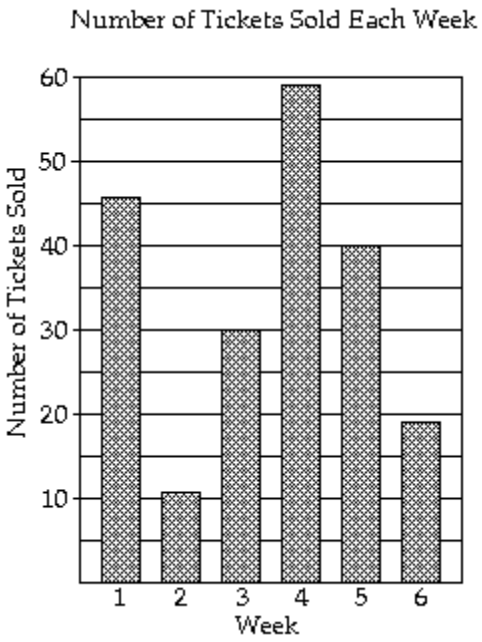
4) True or False: The sum of all the relative frequencies of a distribution will always add up to 1.

A) False B) True

2 Construct Bar Graphs

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

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



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

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

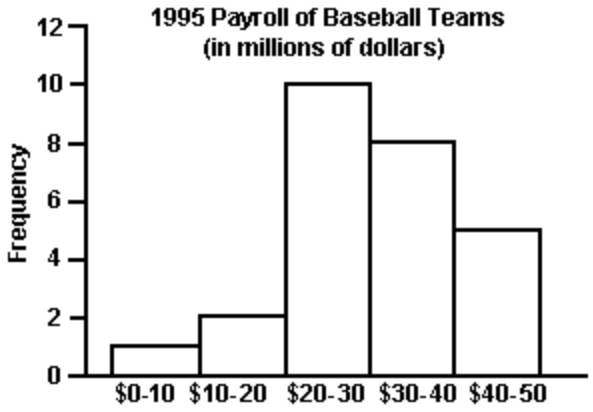
2) During which week was the fewest number of tickets sold?

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

3) How many tickets were sold during week 6?

A) 19 tickets B) 46 tickets C) 11 tickets D) 30 tickets

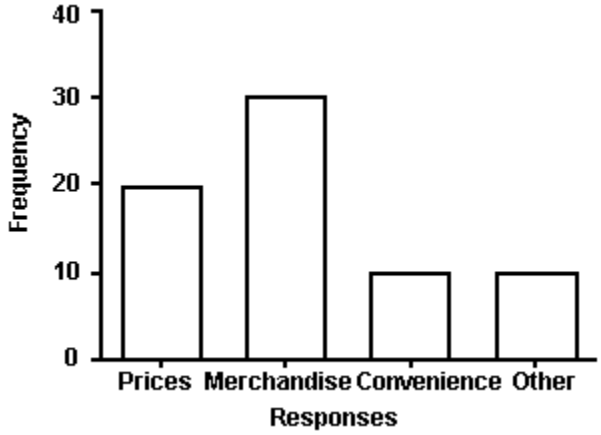
4) The 1995 payroll amounts for all major–league baseball teams are shown below. Answer the following question concerning this graph.



What percentage of the payrolls were in the $40–50 million range?

A) 5% B) 19% C) 23% D) 11%

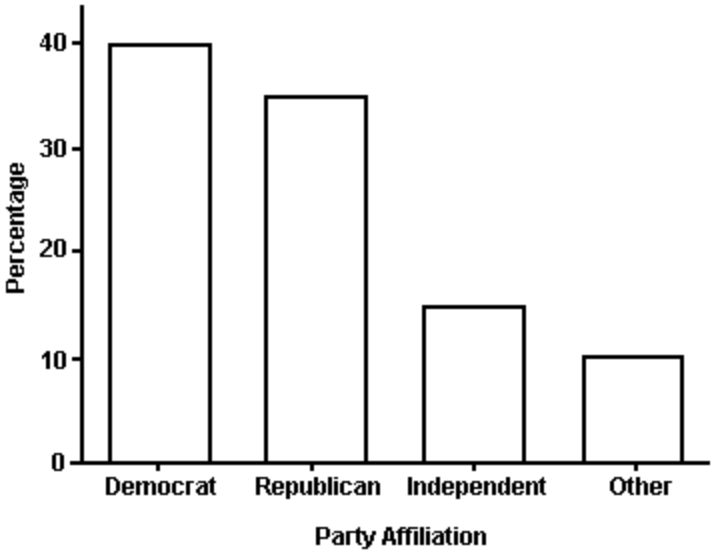
5)



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 here. What percentage of the customers responded that the merchandise was the reason they shopped at the store?

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

6)



The bar graph below shows the political party affiliation of 1,000 registered U.S. voters. What percentage of the 1,000 registered U.S. voters belonged to one of the traditional two parties (Democratic and Republican)?

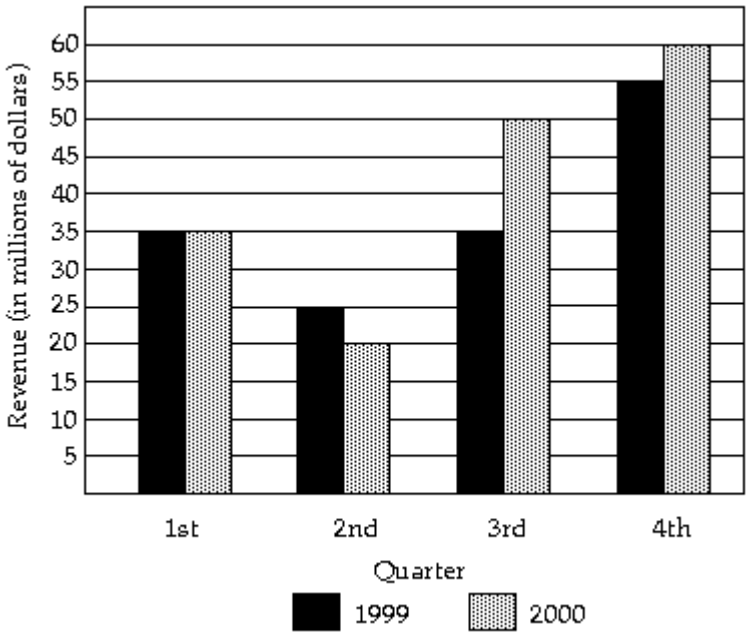
A) 75% B) 40% C) 35% D) 25%

The Excel frequency bar graph below describes the employment status of a random sample of U.S. adults. Use the bar graph to answer the question.

7) What is the percentage of those having no job?

A) 15% B) 20% 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.



8) In what quarter was the revenue the greatest for 1999?

A) fourth quarter B) first quarter C) second quarter D) third quarter

9) In what quarter was the revenue the least for 2000?

A) second quarter B) first quarter C) fourth quarter D) third quarter

10) What was the revenue for the second quarter of 1999?

A) $25 million B) $5 million C) $20 million D) $4 million

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

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

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

12) The Highway Patrol, using radar, checked the speeds (in mph) of 30 passing motorists at a checkpoint. The results are listed below. Construct a frequency bar graph and a relative frequency bar graph.

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

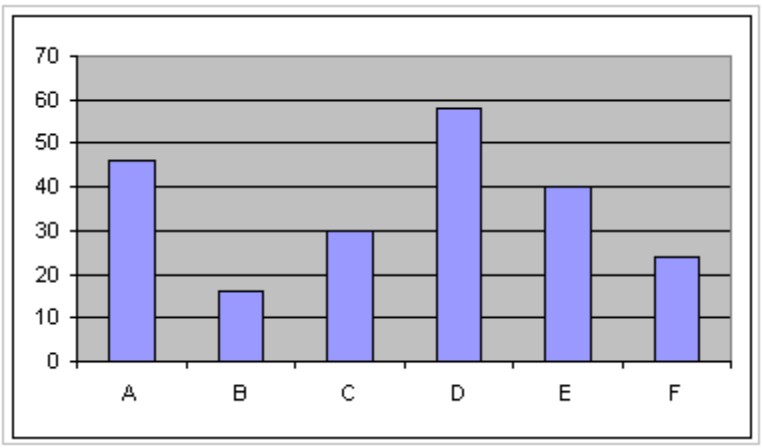
13) Listed below are the ACT scores of 40 randomly selected students at a major university.

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.

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



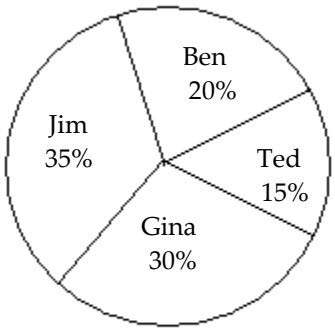
A) D A E C F B B) B F C E A D C) C A D E F B D) B F E D A C

3 Construct Pie Charts

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

The circle graph shows the results of the student council presidential election.

1) Student Council President



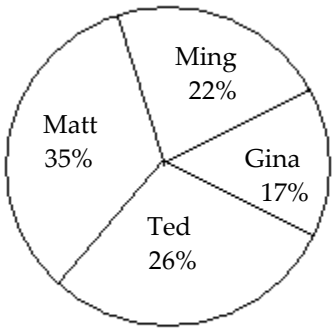
200 total votes

The circle graph shows what percent of the vote each person received.

Who got the most votes?

A) Jim B) Gina C) Ben D) Ted

2) Student Council President



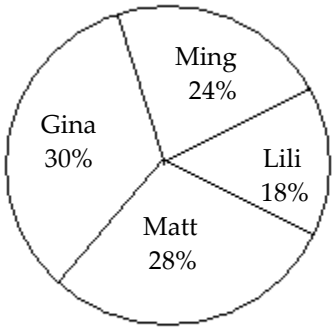
700 total votes

The circle graph shows what percent of the vote each person received.

Who got the fewest votes?

A) Gina B) Ted C) Ming D) Matt

3) Student Council President



200 total votes

The circle graph shows what percent of the vote each person received.

What percent of the votes did Lili and Ming receive together?

A) 42% B) 58% C) 18% D) 24%

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

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

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

Construct a pie chart of the data.

5) 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.

Class	Frequency
Large	345
Medium	830
Small	645

Portray the data in a pie chart using the class percentages.

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

6) A 1–pound bag of Skittles contained 100 Red, 83 Green, 93 Orange, 80 Yellow, and 79 Purple colored Skittles. To create a pie chart of this data the angle for the slice representing each color must be computed. What is the degree measure of the slice representing the green Skittles rounded to the nearest degree?

A) 69° B) 19° C) 5° D) 52°

2.2 Organizing Quantitative Data: The Popular Displays

1 Organize Discrete Data in Tables

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

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

   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.

2) A sample of 25 homework scores is taken and is recorded below. Construct a frequency distribution for this data.

   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

2 Construct Histograms of Discrete Data

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

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

   6, 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

2) A sample of 25 homework scores is taken and is recorded below. Construct a frequency distribution for this data.

   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

3 Organize Continuous Data in Tables

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

1) The grade point averages for 40 students are listed below. Construct a frequency distribution and a relative frequency distribution using eight classes.

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

2) The heights (in inches) of 30 adult males are listed below. Construct a frequency distribution and a relative frequency distribution 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

3) The Highway Patrol, using radar, checked the speeds (in mph) of 30 passing motorists at a checkpoint. The results are listed below. Construct a frequency distribution and a relative frequency distribution using six classes.

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

4) A sample of 15 eighth grade students was selected and their weights were recorded as follows:

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

a. Using a class interval width of 10, give the upper and lower boundaries for five class intervals, where the lower boundary of the first class is 95.
b. Construct a frequency distribution for the data

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

5) The class width is the difference between

A) Two successive lower class limits

B) The high and the low data values

C) The upper class limit and the lower class limit of a class

D) The largest frequency and the smallest frequency

6) The table below summarizes of the weights of Skittles (in grams) for the Skittles in a one pound bag. What is the class width of the classes?

Weight	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
1.0858–1.1184	171
1.1185–1.1784	8

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

4 Construct Histograms of Continuous Data

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

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

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

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

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

3) The heights (in inches) of 30 adult males are listed below. Construct a frequency distribution 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

4) The heights (in inches) of 30 adult males are listed below. Construct a relative frequency distribution 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

5) A sample of 15 eighth grade students was selected and their weights were recorded as follows:

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

Construct a frequency histogram for the data using a class interval width of 10 and the lower boundary of the first class is 95.

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

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

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

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

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

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

5 Draw Stem–and–Leaf Plots

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

1) For the stem–and–leaf plot below, what is the maximum and what is the minimum entry?

```
1 | 4 8
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 | 6 8
```

A) max: 48; min: 14 B) max: 38; min: 7 C) max: 47; min: 18 D) max: 46; min: 14

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

2) 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)

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

Make a stem–and–leaf plot for this data.

3) 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)

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

Make a stem–and–leaf plot for this data.

4) The heights (in inches) of 30 adult males are listed below. Construct a stem–and–leaf chart 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

5) 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.

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

6) The scores for a statistics test are as follows:

87	76	95	77	91	93	88	85	66	89
79	90	50	94	83	88	82	52	12	69

Create a stem–and–leaf display for the data.

7) A sample of 15 eighth grade students was selected and their weights were recorded as follows:

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

Construct a frequency histogram for the data.

6 Draw Dot Plots

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

1) 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.

44	38	41	50	36	36	43	42	49	48
35	40	37	41	43	50	45	54	39	38
50	41	47	36	35	40	42	43	48	33

2) The heights (in inches) of 30 adult males 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

7 Identify the Shape of a Distribution

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

1) For the data below, construct a frequency distribution using five classes. Describe the shape of the distribution. The data set: Pick Three Lottery Outcomes for 10 Consecutive Weeks

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) uniform
B) symmetric
C) skewed to the left
D) skewed to the right

2) For the data below, construct a frequency distribution using five classes. Describe the shape of the distribution.
The data set: ages of 20 cars randomly selected in a student parking lot

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

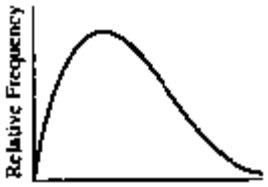
A) symmetric
B) uniform
C) skewed to the left
D) skewed to the right

3) For the data below, construct a frequency distribution using five classes. Describe the shape of the distribution.
The data set: systolic blood pressures of 20 randomly selected patients at a blood bank

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

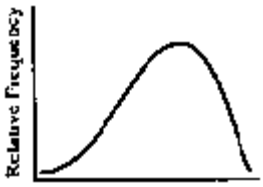
A) symmetric
B) uniform
C) skewed to the left
D) skewed to the right

4) Describe the shape of the distribution.



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

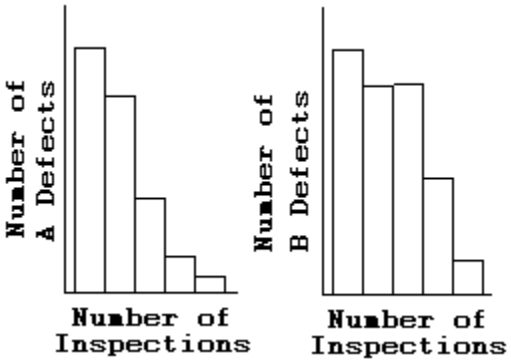
5) Describe the shape of the distribution.



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

Use the histograms shown to answer the question.

6)



Is either histogram symmetric?

A) Neither is symmetric.

B) The first is symmetric, but the second is not symmetric.

C) The second is symmetric, but the first is not symmetric.

D) Both are symmetric.

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

7) A sample of 15 eighth grade students was selected and their weights were recorded as follows:

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

Describe the shape of the distribution.

2.3 Additional Displays of Quantitative Data

1 Construct Frequency Polygons

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

1) For the data below, construct a frequency polygon.

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

2) For the data below, construct a frequency polygon.

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

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

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

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

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

5) The heights (in inches) of 30 adult males are listed below. Construct a frequency polygon 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

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

6) True or False: A frequency Polygon always begins and ends with a frequency of zero.

A) True B) False

7) True or False: The class midpoint can be determined by adding to the lower class limit one–half of the class width.

A) True B) False

2 Create Cumulative Frequency and Relative Frequency Tables

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

1) The grade point averages for 40 students are listed below. Construct a frequency distribution, a relative frequency distribution, a cumulative frequency distribution, and a relative cumulative frequency distribution using eight classes.

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

2) The heights (in inches) of 30 adult males are listed below. Construct a frequency distribution, a relative frequency distribution, a cumulative frequency distribution, and a relative cumulative frequency distribution 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

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

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

3 Construct Frequency and Relative Frequency Ogives

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

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

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

2) The heights (in inches) of 30 adult males 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

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

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

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

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

5) The heights (in inches) of 30 adult males are listed below. Construct a relative 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

6) The Highway Patrol, using radar, checked the speeds (in mph) of 30 passing motorists at a checkpoint. The results are listed below. Construct a relative frequency ogive using six classes.

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.

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

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

4 Draw Time–Series Graphs

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

1) The data below represent the consumption of coffee (in gallons) by adult Americans over a nine –year period. Use a time series chart to display the data. Comment on the trend.

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993
Coffee Consumption	10	11	11	12	13	14	15	15	13

2) A transporation engineer wishes to use the following data to illustrate 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. Comment on the trend.

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

3) 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. Comment on the trend.

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

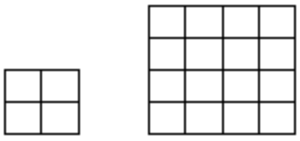
2.4 Graphical Misrepresentations of Data

1 Describe What Can Make a Graph Misleading or Deceptive

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

Explain what is misleading about the graphic.

1)



The volume of our sales has doubled!!!

A) The length of a side has doubled, but the area has been multiplied by 4.

B) The length of a side has doubled, but the area has been multiplied by 8.

C) The length of a side has doubled, but the area has been unchanged.

D) The graphic is not misleading.

2)

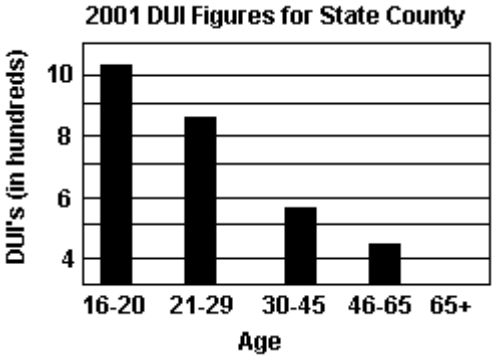
A) The vertical scale does not begin at zero.

B) The horizontal label is incomplete.

C) The trend is depicted in the wrong direction.

D) The graphic is not misleading.

3)



A) The graphic may give the impression that drivers over age 65 had no DUI's in 2001.

B) The graphic only includes information for one year.

C) The horizontal scale does not begin at zero.

D) The graphic is not misleading.

Ch. 2 Organizing and Summarizing Data
Answer Key

2.1 Organizing Qualitative Data

1 Organize Qualitative Data in Tables

1)

Class	Frequency	Relative Frequency	Percentage
Large	345	.190	19.0
Medium	830	.456	45.6
Small	645	.354	35.4
Total	1820	1.000	100.0

2)

Response	Frequency	Relative Frequency
Strongly Favor	21	0.105
Favor	30	0.15
Neutral	12	0.06
Oppose	13	0.065
Strongly Oppose	124	0.62

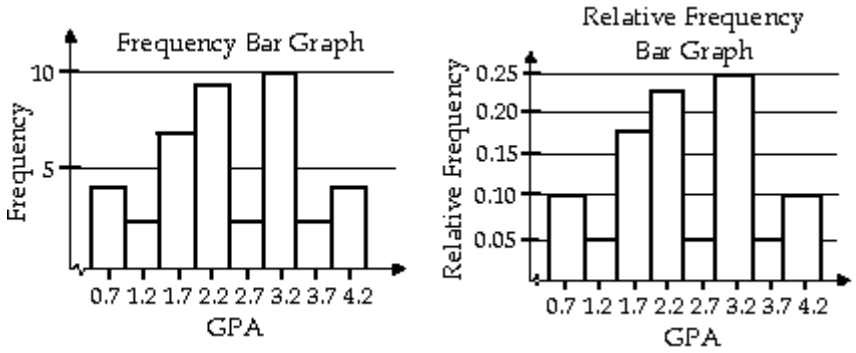
3)

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

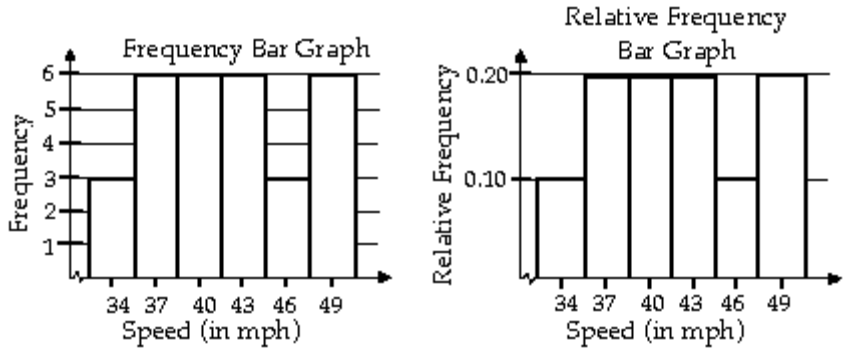
4) A

2 Construct Bar Graphs

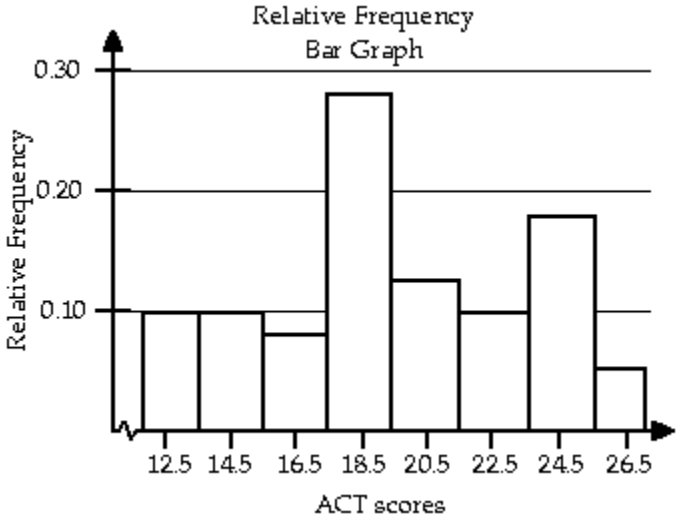
1) A
2) A
3) A
4) A
5) A
6) A
7) A
8) A
9) A
10) A
11)



12)



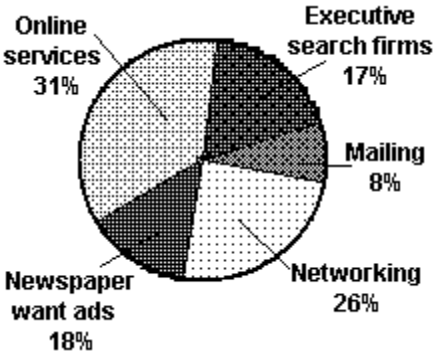
13) a) See graph below
b) The minimum score = 14
c) The university will accept 76.57% of the applicants.



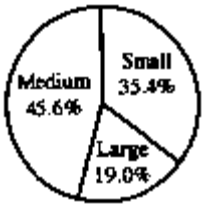
14) A

3 Construct Pie Charts

1) A
2) A
3) A
4)



5)



6) A

2.2 Organizing Quantitative Data: The Popular Displays

1 Organize Discrete Data in Tables

1)

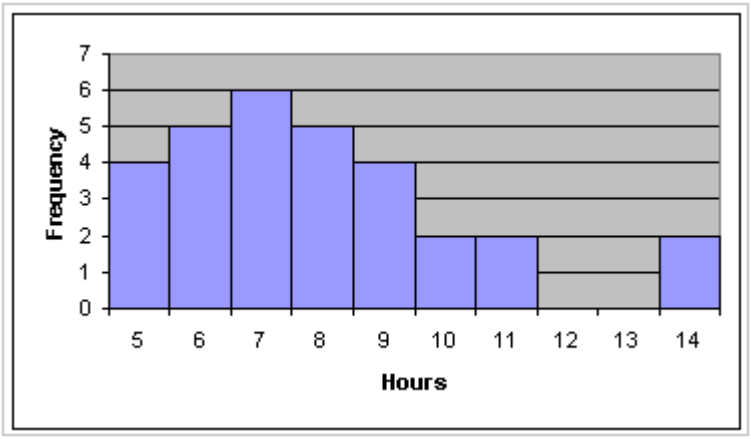
Hours of TV	Number of HS Students
13	4
14	5
15	6
16	5
17	4
18	2
19	2
22	2

2)

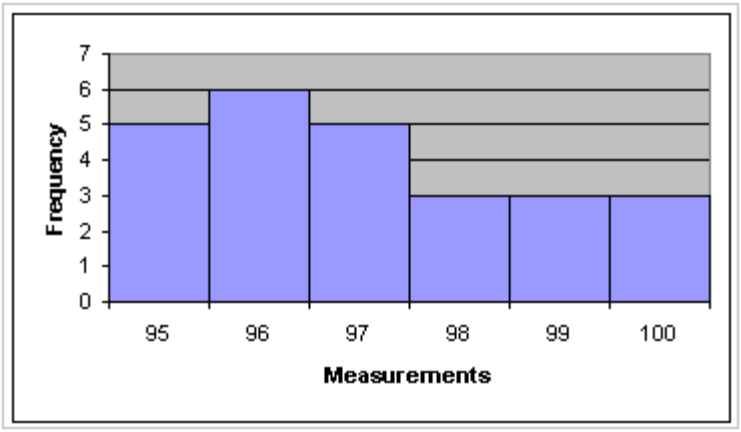
Measure	Frequency
95	5
96	6
97	5
98	3
99	3
100	3

2 Construct Histograms of Discrete Data

1)



2)



3 Organize Continuous Data in Tables

1)

GPA	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

2)

Height (in inches)	Frequency	Relative Frequency
67.0–68.4	6	0.20
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

3)

Speed (in mph)	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

4) a. 95–104, 105–114, 115–124, 125–134, 135–144

b.

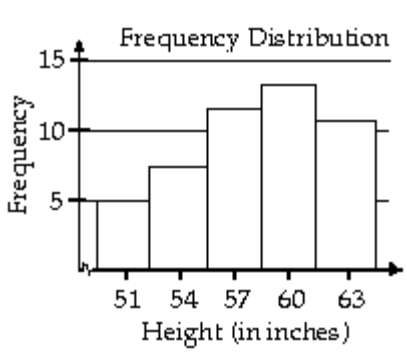
	Tally	Frequency
95–104	ll	2
105–114	lll	3
115–124	lllll	5
125–134	lll	3
135–144	ll	2

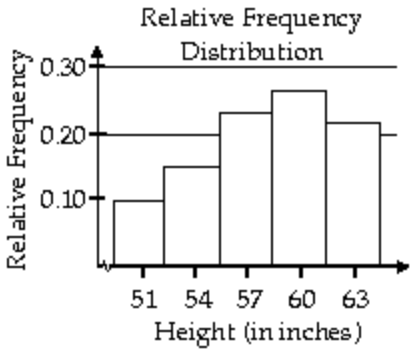
5) A

6) A

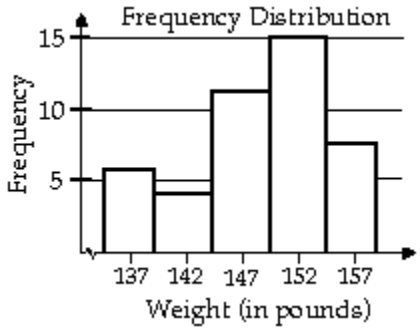
4 Construct Histograms of Continuous Data

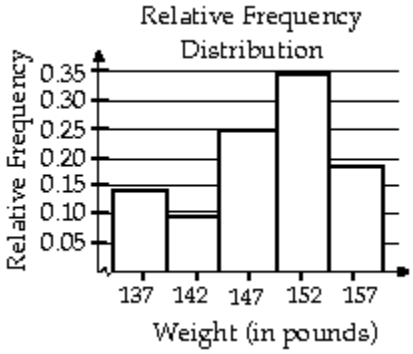
1)



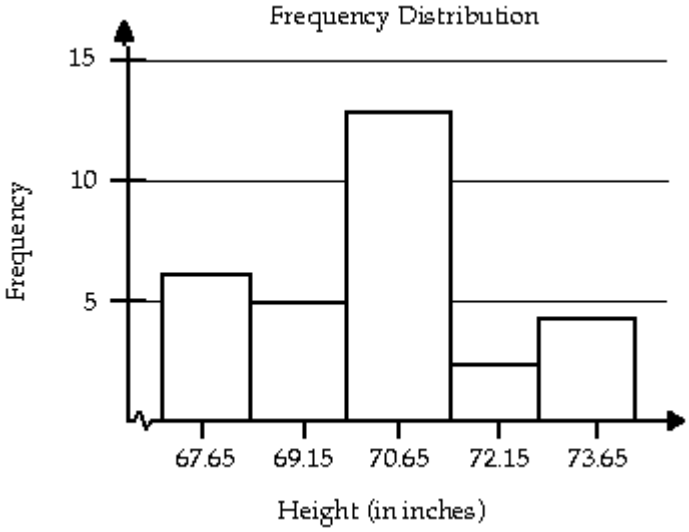


2)

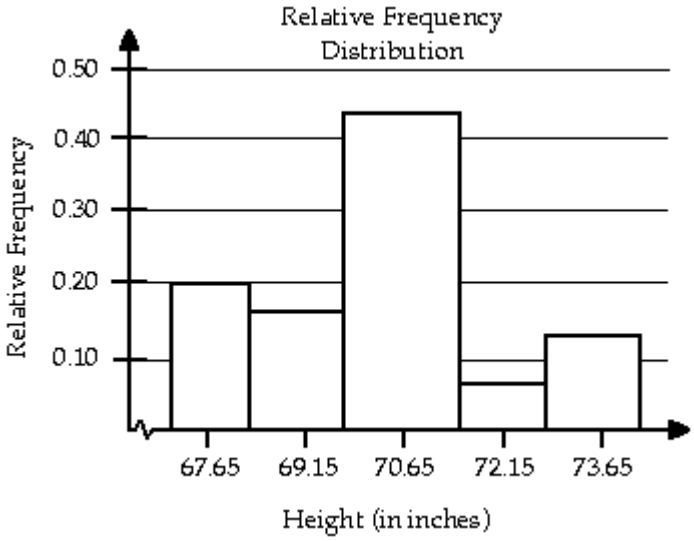




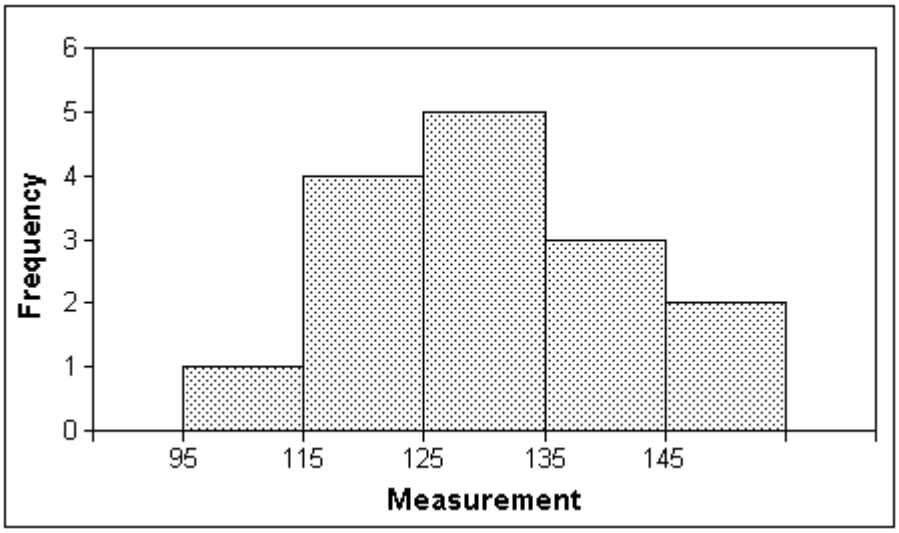
3)



4)



5)



6) A

5 Draw Stem-and-Leaf Plots

1) A

2)

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

3)

0	0 9 9
1	
2	5
3	
4	
5	6 6
7	
8	8
9	1
10	2
11	4
12	2
13	
14	
15	0
16	5

4)

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

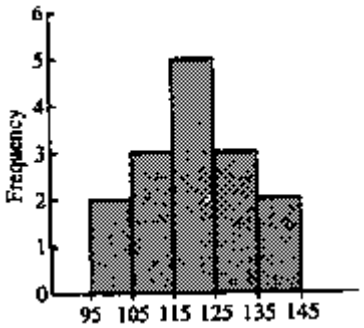
5)

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

6) 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.

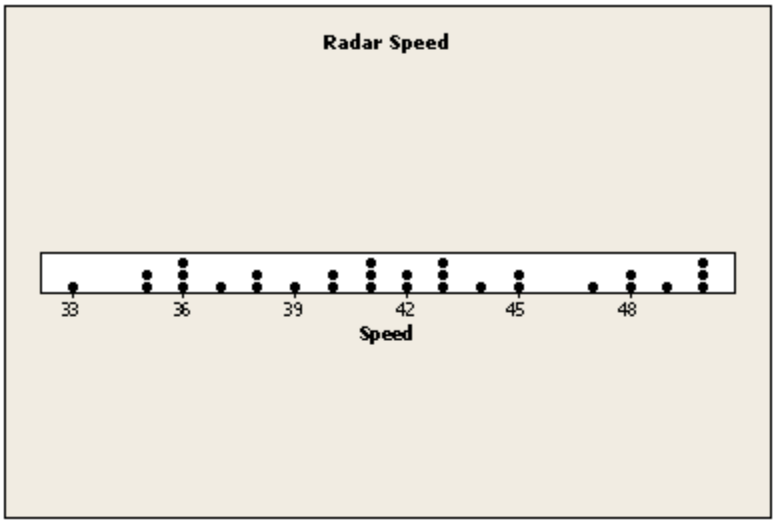
Stem	Leaves
1	2
2	
3	
4	
5	0 2
6	6 9
7	6 7 9
8	7 8 5 9 3 8 2
9	5 1 3 0 4

7)

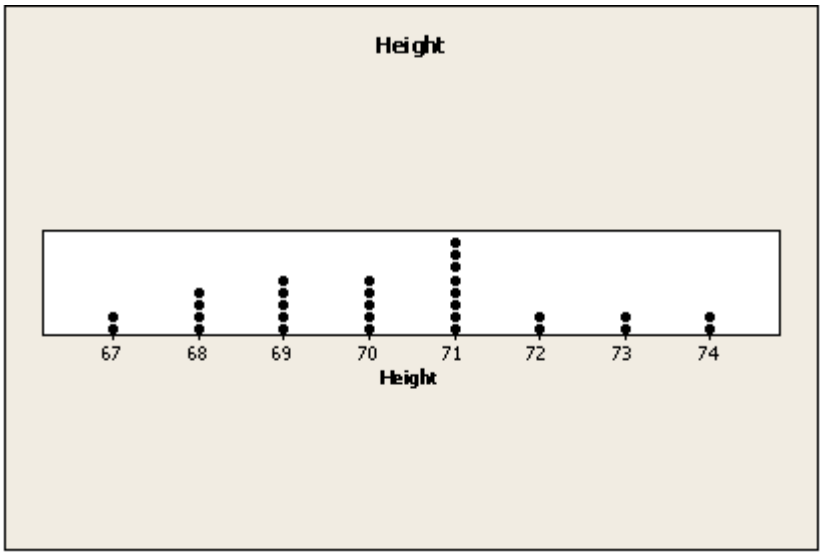


6 Draw Dot Plots

1)



2)



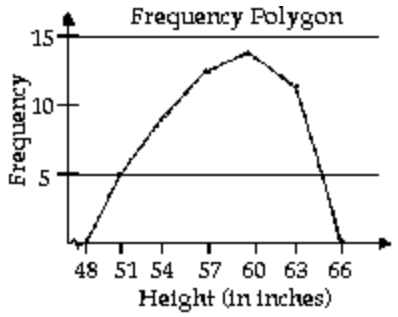
7 Identify the Shape of a Distribution

1) A
2) A
3) A
4) A
5) A
6) A
7) symmetric

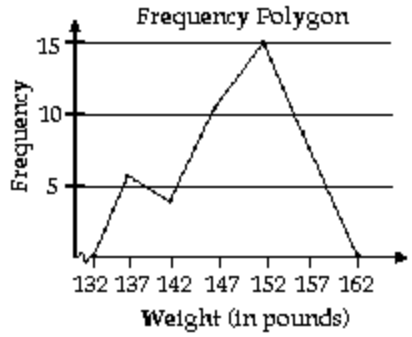
2.3 Additional Displays of Quantitative Data

1 Construct Frequency Polygons

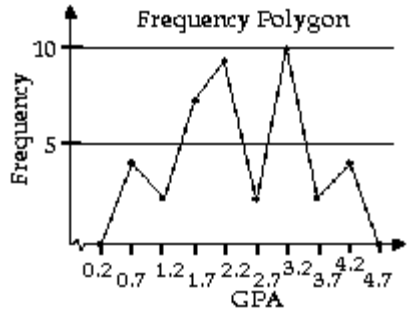
1)



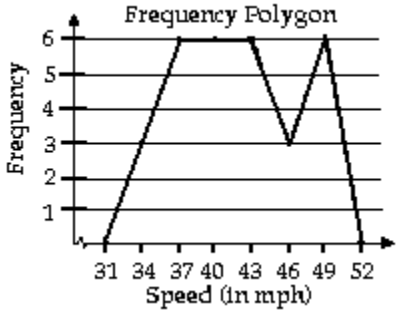
2)



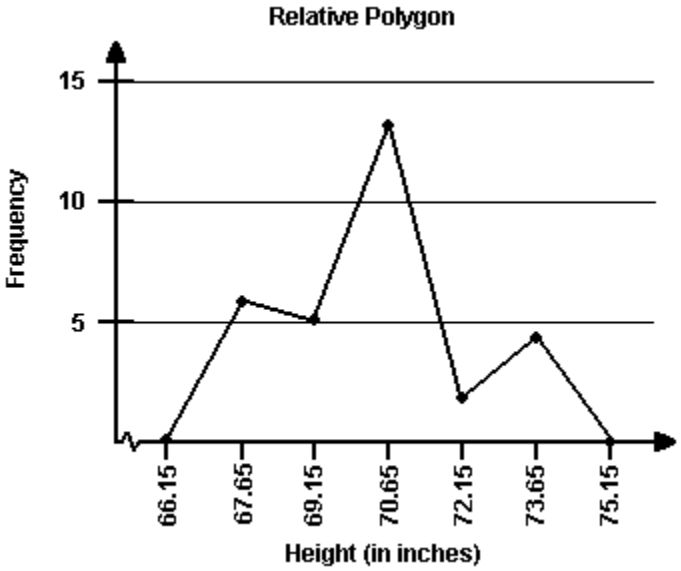
3)



4)



5)



6) A

7) A

2 Create Cumulative Frequency and Relative Frequency Tables

1)

GPA	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

2)

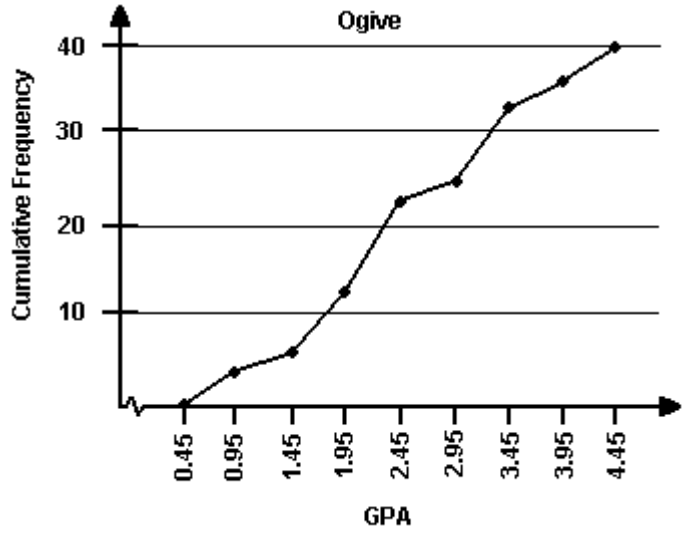
Height (in inches)	Frequency	Relative Frequency	Cumulative Frequency	Cumulative Relative Frequency
67.0–68.4	6	0.20	6	0.20
68.5–69.9	5	0.167	11	0.367
70.0–71.4	13	0.433	24	0.80
71.5–72.9	2	0.067	26	0.867
73.0–74.4	4	0.133	30	1

3)

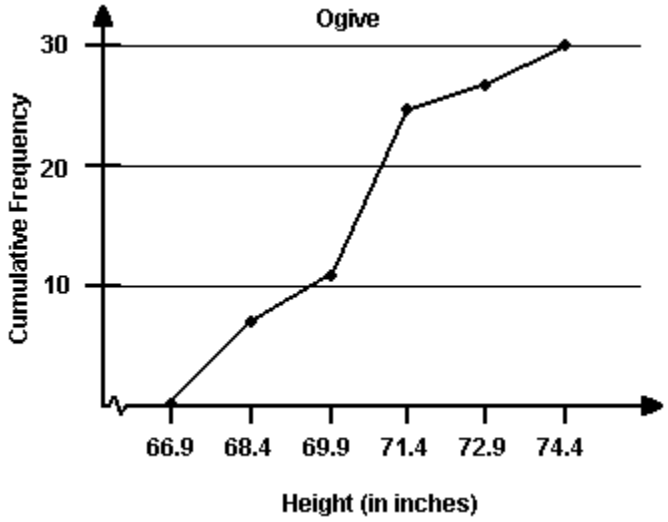
Speed (in mph)	Frequency	Relative Frequency	Cumulative Frequency	Cumulative Relative Frequency
33–35	3	0.10	3	0.10
36–38	6	0.20	9	0.30
39–41	6	0.20	15	0.50
42–44	6	0.20	21	0.70
45–47	3	0.10	24	0.80
48–50	6	0.20	30	1

3 Construct Frequency and Relative Frequency Ogives

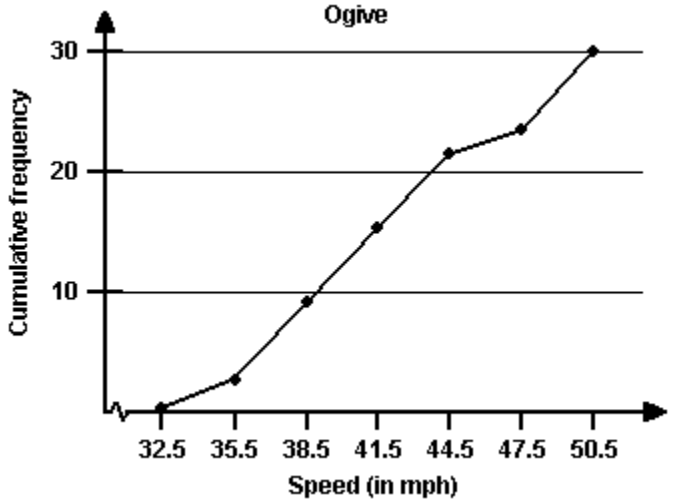
1)



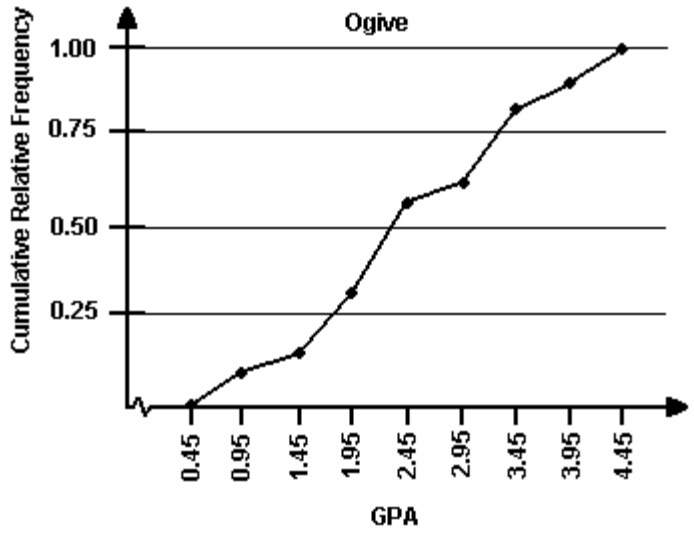
2)



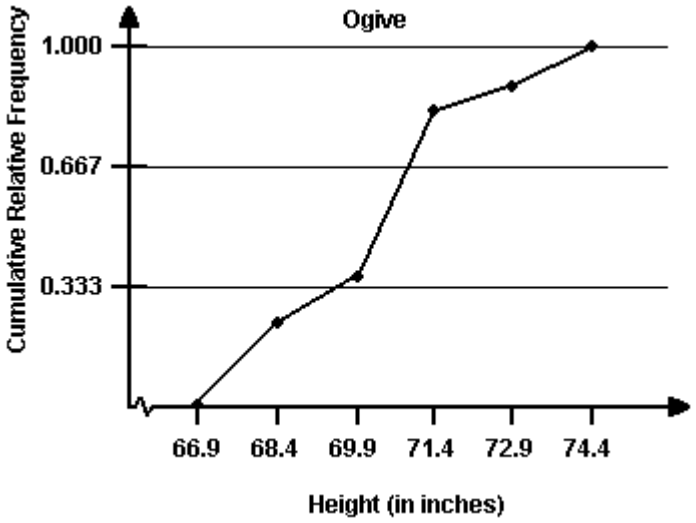
3)



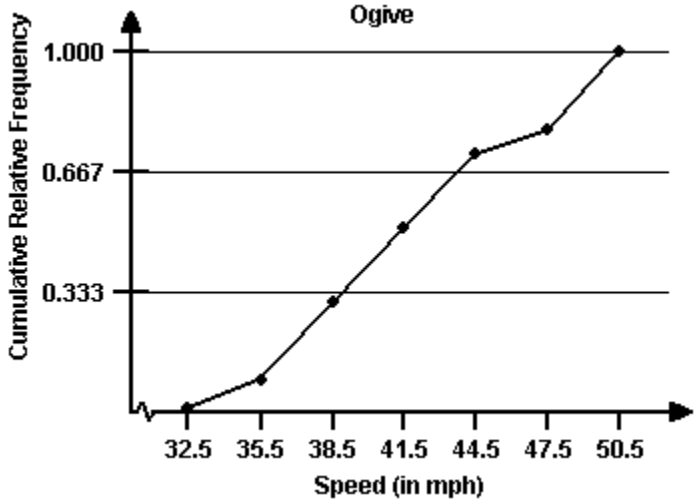
4)


Ogive
Cumulative Relative Frequency
1.00
0.75
0.50
0.25
0.45
0.95
1.45
1.95
2.45
2.95
3.45
3.95
4.45
GPA

5)


Ogive
Cumulative Relative Frequency
1.000
0.667
0.333
66.9
68.4
69.9
71.4
72.9
74.4
Height (in inches)

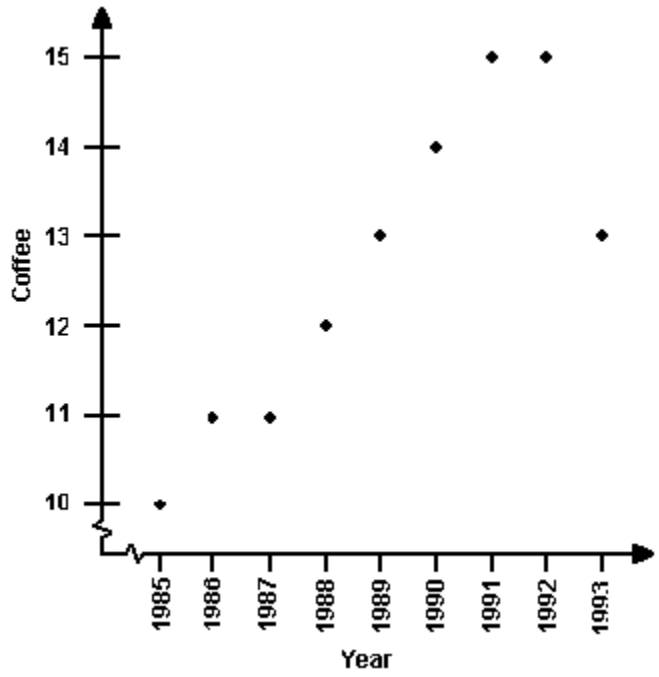
6)


Ogive
Cumulative Relative Frequency
1.000
0.667
0.333
32.5
35.5
38.5
41.5
44.5
47.5
50.5
Speed (in mph)

7) A

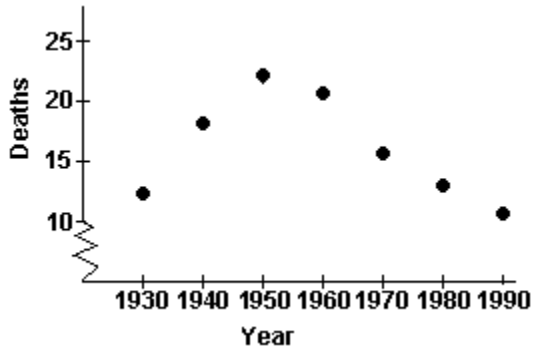
4 Draw Time–Series Graphs

1)



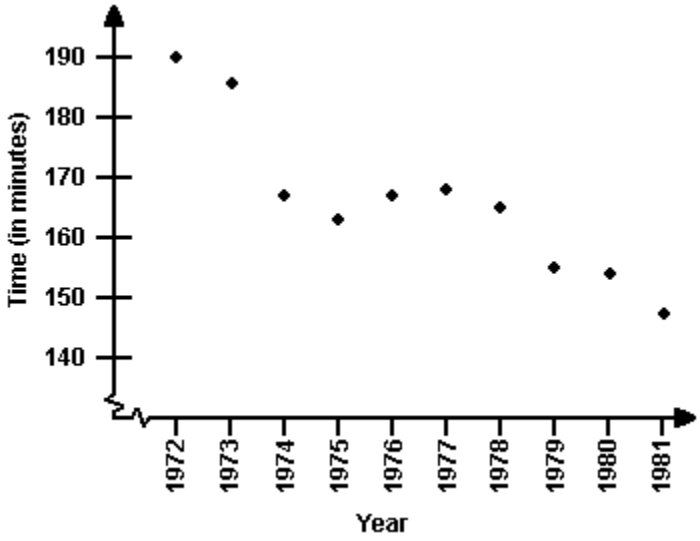
In general, there is an increasing trend in the coffee consumption of adult Americans. However, beginning in 1993, there is sign of a decreasing trend.

2)



From 1930 to 1950, there was an increasing trend in the number of collisions deaths. Subsequently, there was a decreasing trend.

3)



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

2.4 Graphical Misrepresentations of Data

1 Describe What Can Make a Graph Misleading or Deceptive

1) A
2) A
3) A