Name_____ Course Number:_____ Section Number:_____

Directions: Answer the questions in the spaces provided, or attach paper. Circle the correct choice for each response set.

Provide an appropriate response.

1) Suppose you are comparing frequency data for two different groups, 25 managers and 150 blue collar workers. Why would a relative frequency distribution be better than a frequency distribution?

2) The following histogram shows average SO_2 (sulfur dioxide) boiler emission rates from selected utility companies. The data was collected from a voluntary response sample of utility companies. Does the distribution depicted in the histogram reflect the true distribution of the population? Why or why not?

Average Sulfur Dioxide Emission Rates
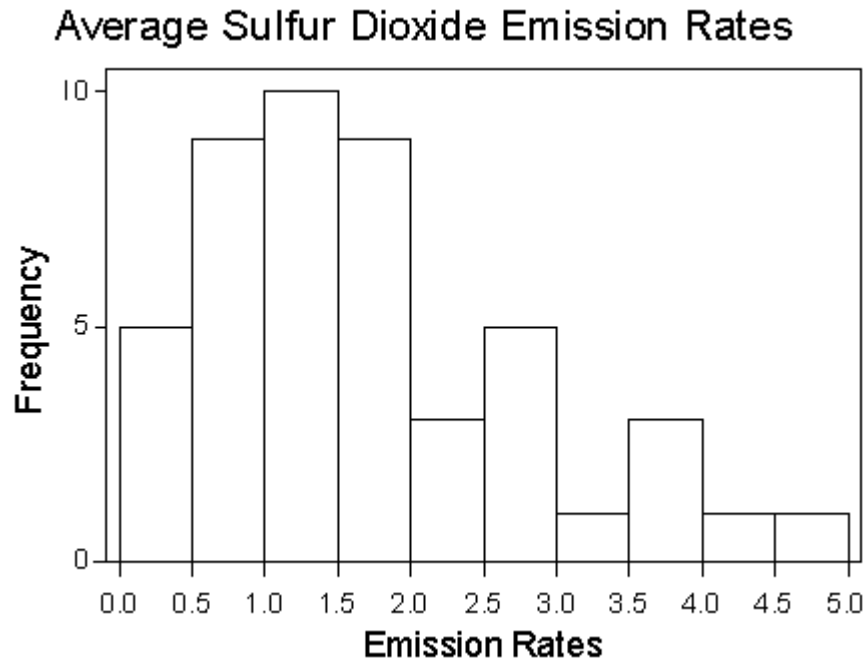
3) The frequency distribution below summarizes the home sale prices in the city of Summerhill for the month of June. Determine the class midpoint for class 235.0–265.9.

(Sale price in thousand $)	Frequency
80.0 – 110.9	2
111.0 – 141.9	5
142.0 – 172.9	7
173.0 – 203.9	10
204.0 – 234.9	3
235.0 – 265.9	1

A) 250.55   B) 250.45   C) 250.50   D) 250.40

4) The frequency distribution below summarizes employee years of service for Alpha Corporation. Find the class boundaries for class 26–30.

Years of service	Frequency
1–5	5
6–10	20
11–15	25
16–20	10
21–25	5
26–30	3

A) 25.5, 30.5   B) 26.5, 30.5   C) 26.5, 29.5   D) 25.5, 20.5

Construct the cumulative frequency distribution that corresponds to the given frequency distribution.

5)

Weight (oz)	Number of Stones
1.2–1.6	5
1.7–2.1	2
2.2–2.6	5
2.7–3.1	5
3.2–3.6	13

A)

Weight (oz)	Cumulative Frequency
1.2–1.6	5
1.7–2.1	7
2.2–2.6	12
2.7–3.1	17
3.2–3.6	30

B)

Weight (oz)	Cumulative Frequency
Less than 2.2	7
Less than 3.2	17
Less than 3.7	30

C)

Weight (oz)	Cumulative Frequency
Less than 1.7	5
Less than 2.2	7
Less than 2.7	12
Less than 3.2	17
Less than 3.7	30

D)

Weight (oz)	Cumulative Frequency
Less than 1.7	5
Less than 2.2	7
Less than 2.7	12
Less than 3.2	17
Less than 3.7	28

Solve the problem.

6) Construct one table that includes relative frequencies based on the two frequency distributions below. Do those weights appear to be about the same or are they substantially different.? Round to the nearest tenth of a percent if necessary.

Weight (lb) of Discarded Metal	Frequency
0.00–0.99	6
1.00–1.99	20
2.00–2.99	12
3.00–3.99	9
4.00–4.99	6

Weight (lb) of Discarded Plastic	Frequency
0.00–0.99	11
1.00–1.99	16
2.00–2.99	15
3.00–3.99	6
4.00–4.99	4
5.00–5.99	1

Use the given data to construct a frequency distribution.

7) Lori asked 24 students how many hours they had spent doing homework during the previous week. The results are shown below.

11 10 11   9 11 11 15 12 11   8 13 10
10 13 11 10 13 11 10 12 10 13 12   9

Construct a frequency distribution. Use 4 classes, a class width of 2 hours, and a lower limit of 8 for class 1.

Hours	Frequency

Provide an appropriate response.

8) The histogram below represents the number of television sets per household for a sample of U.S. households. How many households are included in the histogram?
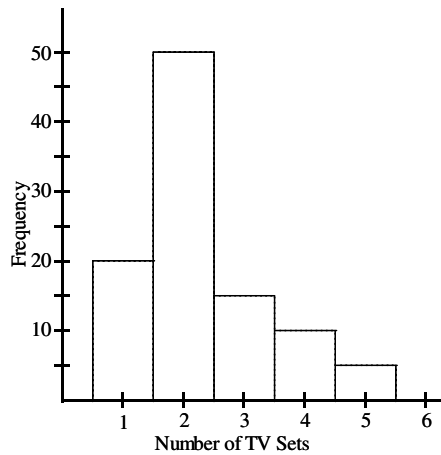
A) 110   B) 90   C) 100   D) 95

Use the data to create a stemplot.

9) The attendance counts for this season's basketball games are listed below.
227 239 215 219
221 233 229 233
235 228 245 231

A)

21	5 7 9
22	1 8 9
23	1 3 3 5 9
24	5

B)

21	5 9
22	1 7 8 9
23	1 3 3 5 9
24	5

10) The ages of the 45 members of a track and field team are listed below. Construct an expanded stemplot with about 8 rows.

21 18 42 35 32 21 44 25 38 48 14 19 23 22 28
32 34 27 31 17 16 41 37 22 24 33 32 21 26 30
22 27 32 30 20 18 17 21 15 26 36 31 40 16 25

A)
```
1 | 4 5
1 | 5 6 6 7 7 8 8 9
2 | 0 1 1 1 1 2 2 2 3 4 5 5
2 | 5 5 6 6 7 7 8
3 | 0 0 1 1 2 2 2 2 3 4 5
3 | 5 6 7 8
4 | 0 1 2 4
4 | 8
```

B)
```
1 | 4
1 | 5 6 6 7 7 8 8 9
2 | 0 1 1 1 1 2 2 2 3 4
2 | 5 5 6 6 7 7 8
3 | 0 0 1 1 2 2 2 2 3 4
3 | 5 6 7 8
4 | 0 1 2 4
4 | 8
```

Find the original data from the stemplot.

11)

Stem	Leaves
6	1 7
7	1 1 4 7
8	1 4 4 7 9
9	4 4

A) 7, 13, 7, 7, 10, 13, 9, 9, 12, 15, 17, 13, 13, 17

B) 61, 67, 71, 71, 74, 77, 81, 84, 84, 87, 89, 94, 94

C) 64, 64, 64, 71, 71, 74, 77, 81, 81, 94, 94

D) 61, 67, 74, 74, 77, 84, 84, 87, 89, 94, 94

Construct the dotplot for the given data.

12) The frequency chart shows the distribution of defects for the machines used to produce a product.

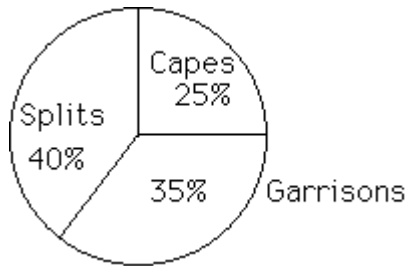| Defects	Frequency
0	1
1	3
2	0
3	2
4	4
5	0

A)
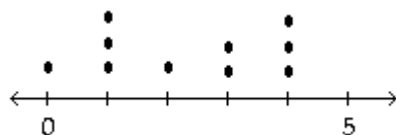
B)
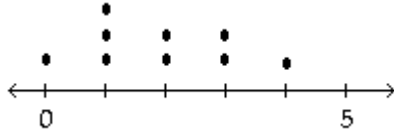
C)
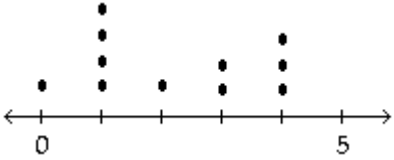
D)
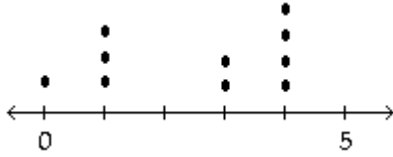
Construct a pie chart representing the given data set.

13) The following data give the distribution of the types of houses in a town containing 12,000 houses.
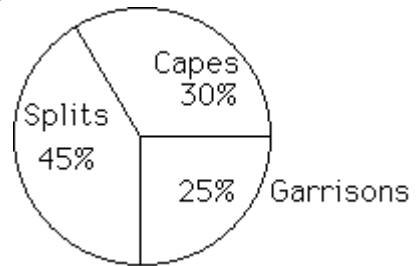
| Capes	Garrisons	Splits
3000	4200	4800
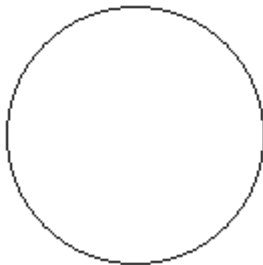
A)

B)

Note: For #14, four–choice response set follows.
Solve the problem.

6

14) A car dealer is deciding what kinds of vehicles he should order from the factory. He looks at his sales report for the preceding period. Choose the vertical scale so that the relative frequencies are represented.

Vehicle	Sales
Economy	38
Sports	9.5
Family	66.5
Luxury	19
Truck	57
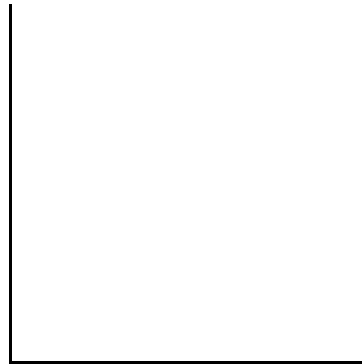
Construct a Pareto chart to help him decide.

A)

B)

C)

D)

7
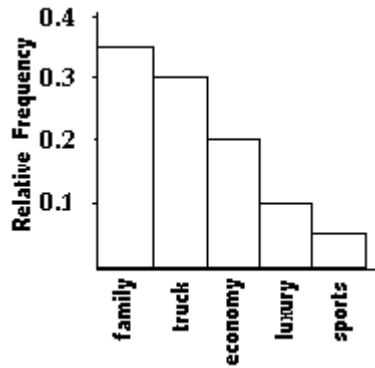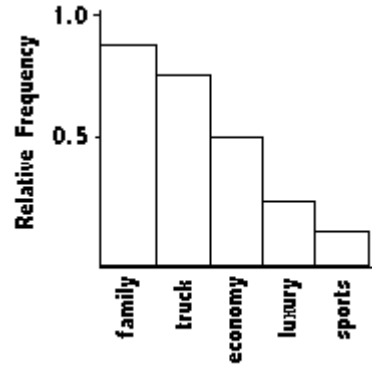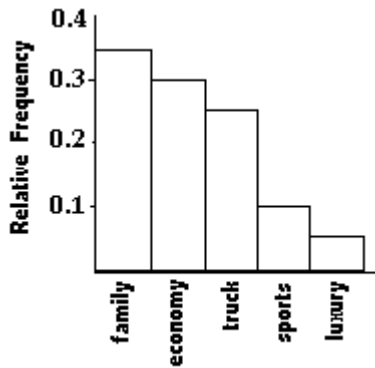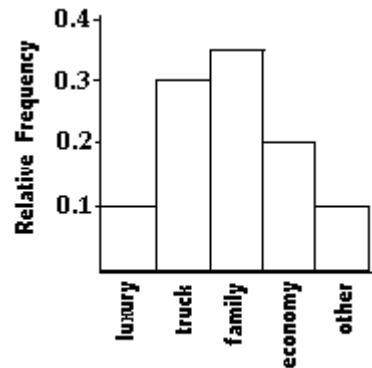
Use the pie chart to solve the problem.

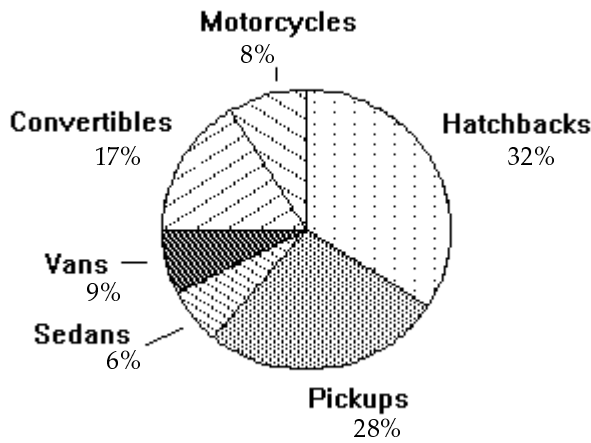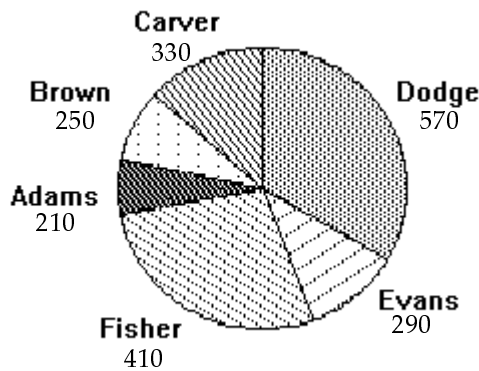15) A survey of the 2179 vehicles on the campus of State University yielded the following pie

chart.
Together, what percent of the vehicles are either vans or convertibles?

A) 153% B) 8% C) 17% D) 26%

16) The pie chart below gives the number of students in the residence halls at the state university.


Write the ratio of the number of residents at Dodge to the number of students at Adams.

A) $\dfrac{7}{19}$ B) $\dfrac{19}{7}$ C) $\dfrac{57}{206}$ D) $\dfrac{285}{103}$
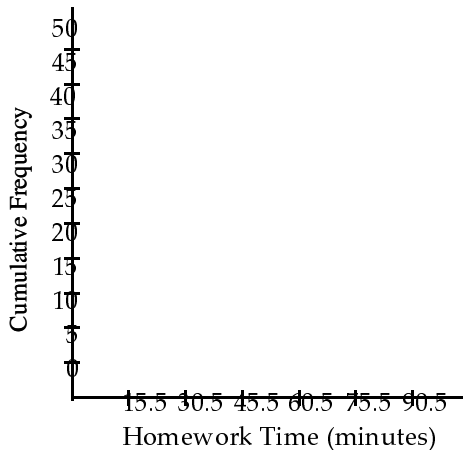
Provide an appropriate response.

17) The graph below shows the number of car accidents occurring in one city in each of the years 2001 through 2006. The number of accidents dropped in 2003 after a new speed limit was imposed. Does the graph distort the data? How would you redesign the graph to be less misleading?
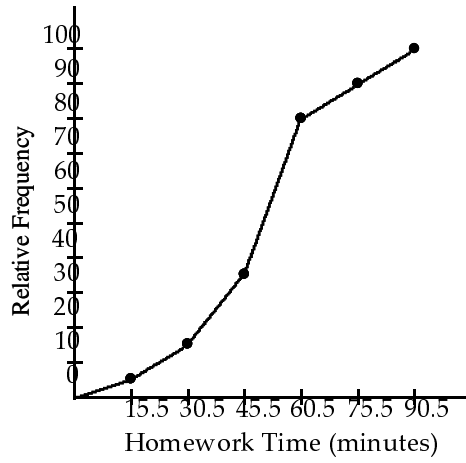
Number of
accidents

```
120
110
100
 90
 80
 70
 60
     01  02  03  04  05  06
            Year
```
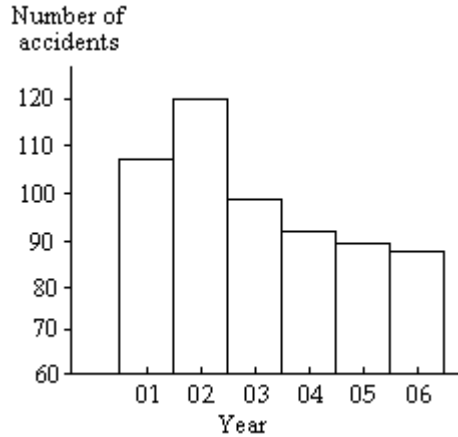
18) The table contains data from a study of daily study time for 40 students from Statistics 101. Construct an ogive from the data.

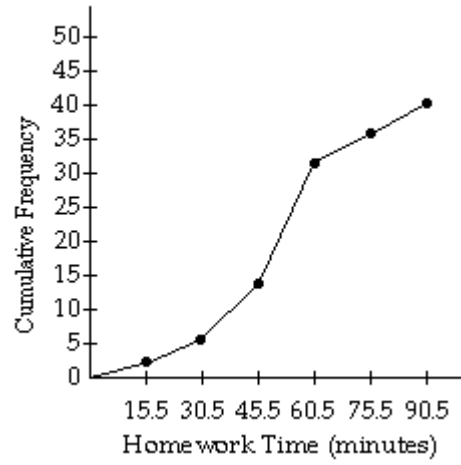| Minutes on homework	Number of students	Relative frequency	Cumulative frequency
0–15	2	0.05	2
16–30	4	0.10	6
31–45	8	0.20	14
46–60	18	0.45	32
61–75	4	0.10	36
76–90	4	0.10	40

```
Cumulative Frequency
50
45
40
35
30
25
20
15
10
 5
 0
     15.5 30.5 45.5 60.5 75.5 90.5
        Homework Time (minutes)
```

A)

Homework Time (minutes)

B)

Homework Time (minutes)

C)

Homework Time (minutes)

D)

Homework Time (minutes)
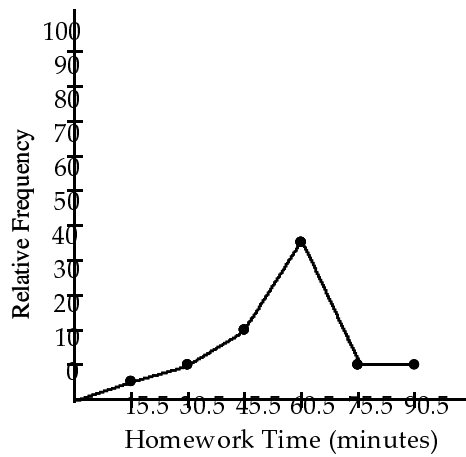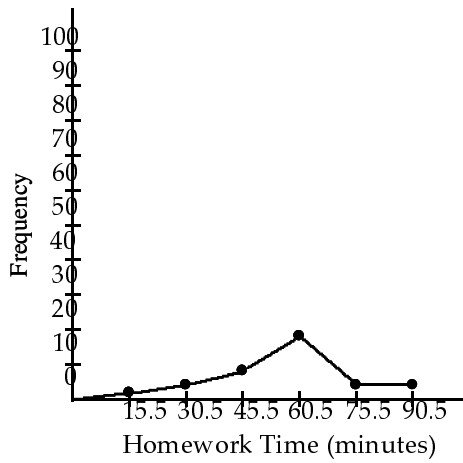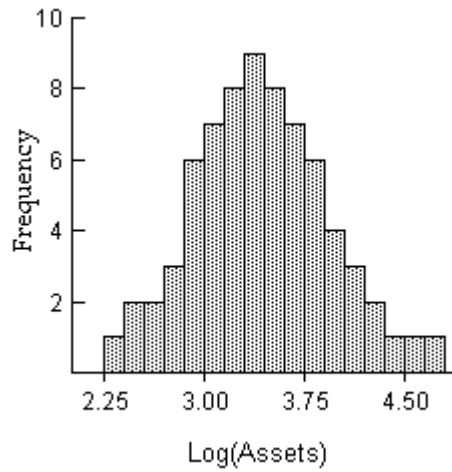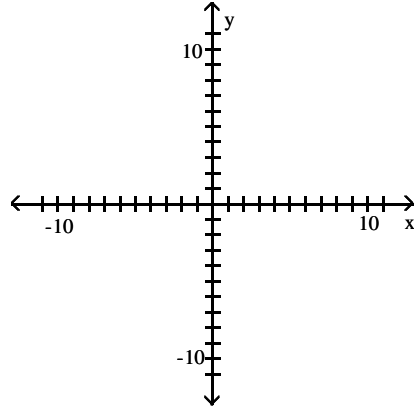
Solve the problem.

19) The histogram below shows the distribution of the assets (in millions of dollars) of 71 companies. Does the distribution appear to be normal?
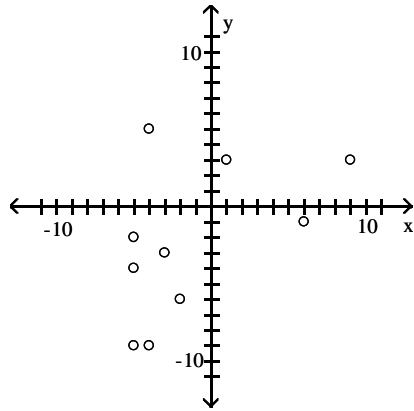

Note: #20 has a four–choice response set.
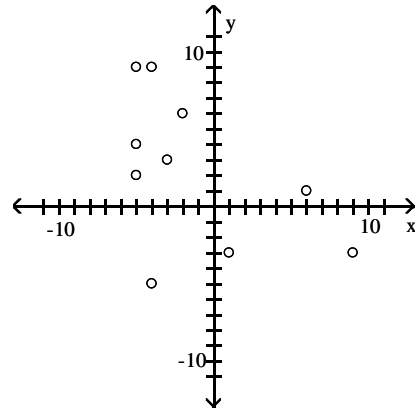**Use the given paired data to construct a scatterplot.**

20) x −4 −5 −3 −5   1   6 −5   9 −4 −2
    y   5 −2 −3 −9   3 −1 −4   3 −9 −6

A)

B)

C)

D)
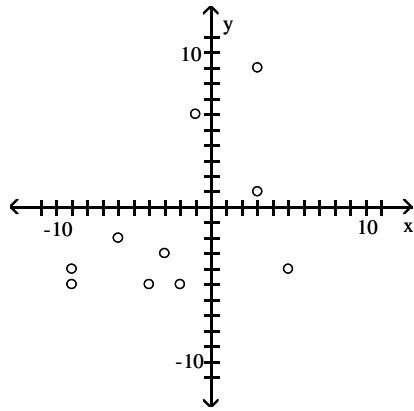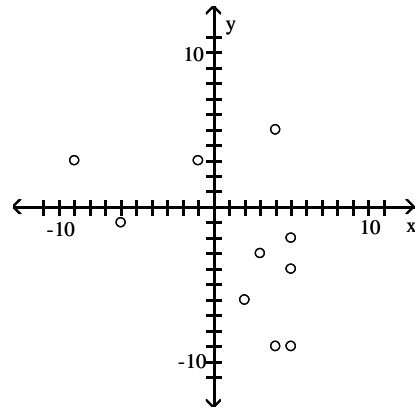
1) Answers will vary. Possible answer: A relative frequency distribution is better for comparison between groups whose numbers are different, since ratios are readily comparable.
2) Not necessarily. The voluntary response sample may have characteristics fundamentally different from those of the population of all utility companies. Utilities with smaller emission rates might be more likely to respond, causing the voluntary response sample to show a smaller range of emission rates than found in the general population.
3) B
4) A
5) C

6)

Weight (lb)	Relative Frequency (Metal)	Relative Frequency (Plastic)
0.00–0.99	11.3%	20.8%
1.00–1.99	37.7%	30.2%
2.00–2.99	22.6%	28.3%
3.00–3.99	17.0%	11.3%
4.00–4.99	11.3%	7.5%
5.00–5.99	0%	1.9%

The weights are different, but they do not appear to be substantially different.

7)

Hours	Frequency
8–9	3
10–11	13
12–13	7
14–15	1

8) C
9) B
10) B
11) B
12) D
13) A
14) A
15) D
16) B
17) 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 120 to 100. To make the graph less misleading, change the vertical scale so that it begins at 0 and increases in increments of 20.
18) B
19) Yes, the distribution appears to be normal, since the histogram is essentially bell–shaped.
20) A