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

Provide an appropriate response.

1) The range and standard deviation of the data set below are 35 and 12.47 respectively.
5, 24, 25, 26, 40

If the 26 is replaced with 39, how will this affect the range? How will this affect the standard deviation? How does this illustrate one advantage of the standard deviation over the range as a measure of spread?

2) The weekly salaries (in dollars) of 24 randomly selected employees of a company are shown below, and displayed in the boxplot.

```
310 320 450 460 470 500 520 540
580 600 650 700 710 840 870 900
1000 1200 1250 1300 1400 1720 2500 3700
```

Find the median. Do you think that the mean will be smaller or larger than this? Which is the most appropriate measure of center in this case?

3) Roughly speaking, the standard deviation indicates how far, on average, the observations are from the mean. Do you think that for the data set below the standard deviation will give a good indication of the typical deviation from the mean?

2, 3, 4, 4, 5, 5, 6, 6, 100

What drawback of the standard deviation is illustrated by this example?
4) The table below shows the number of absences and the final grades of 9 randomly selected students from a statistics class.

<table>
<thead>
<tr>
<th>Number of absences</th>
<th>Final grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>90</td>
</tr>
<tr>
<td>6</td>
<td>80</td>
</tr>
<tr>
<td>8</td>
<td>70</td>
</tr>
<tr>
<td>10</td>
<td>60</td>
</tr>
<tr>
<td>12</td>
<td>50</td>
</tr>
<tr>
<td>14</td>
<td>40</td>
</tr>
<tr>
<td>16</td>
<td>30</td>
</tr>
</tbody>
</table>

If you are a teacher trying to convince students of the importance of not missing classes, would it be to your advantage to lengthen the scale of the vertical axis or to lengthen the scale of the horizontal axis? Explain your thinking.

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

5) Following are box-and-whisker plots comparing the study times in hours per week for Sarah and Elaine.

What is the value of Q1 for Sarah? for Elaine?
A) Sarah, 2 hours; Elaine, 3 hours  
B) Sarah, 3 hours; Elaine, 6 hours
C) Sarah, 5 hours; Elaine, 8 hours  
D) Sarah, 0 hours; Elaine, 2 hours

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

6) If Jill had test scores of 87, 92, 33, 90, 85, 96, and 94, would she prefer that the teacher used her median score or her mean score as her final grade? Explain.
7) The line graph below shows the high closing values of Naristar Inc. stock from the years 1990 – 2001. x = 0 represents 1990, x = 1 represents 1991 and so on.

<table>
<thead>
<tr>
<th>Year</th>
<th>High</th>
<th>Year</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>42</td>
<td>1996</td>
<td>47</td>
</tr>
<tr>
<td>1991</td>
<td>40</td>
<td>1997</td>
<td>60</td>
</tr>
<tr>
<td>1992</td>
<td>31</td>
<td>1998</td>
<td>61</td>
</tr>
<tr>
<td>1993</td>
<td>42</td>
<td>1999</td>
<td>57</td>
</tr>
<tr>
<td>1994</td>
<td>44</td>
<td>2000</td>
<td>54</td>
</tr>
<tr>
<td>1995</td>
<td>47</td>
<td>2001</td>
<td>30</td>
</tr>
</tbody>
</table>

What would be the effect of lengthening the scale of the vertical axis? How might that influence the interpretation of the graph?

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

8) Following are box-and-whisker plots comparing the study times in hours per week for Sarah and Elaine.

Which student has the greatest interquartile range?
A) Sarah  
B) Elaine

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

9) If a constant m is added to each score in a set of scores, how will this affect the mean, median, mode, range, standard deviation, and variance?
10) The table below provides a frequency distribution for the winner of the Davis Cup during the period 1977–1994.

<table>
<thead>
<tr>
<th>Winner of Davis Cup</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>6</td>
</tr>
<tr>
<td>Germany</td>
<td>3</td>
</tr>
<tr>
<td>Czechoslovakia</td>
<td>1</td>
</tr>
<tr>
<td>Australia</td>
<td>3</td>
</tr>
<tr>
<td>France</td>
<td>1</td>
</tr>
<tr>
<td>Sweden</td>
<td>4</td>
</tr>
</tbody>
</table>

Which measure of center, the mean, the median, or the mode is most appropriate here? Why?

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

11) The following dot plot represents the ages of the people in a sample selected from a group of campaign volunteers.

![Dot plot](Image)

How many people were in the sample?
A) 30  B) 27  C) 28  D) 21

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

12) The graph shows the increases in a certain expenditure over a four-year period. What is wrong with the graph?
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

13) The following data represent the number of cars passing through a toll booth during a certain period over a number of days. 
38  39  37  37  44  38  41  38  39  35  42  39  43  37  41

Create a dot plot for this data.

A)  
B)  
C)  
D)  

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

14) The bar graph below shows the number of car accidents occurring in one city in each of the years 1993 through 1998. The number of accidents dropped in 1995 after a new speed limit was imposed. Why is the graph misleading? How would you redesign the graph to be less misleading?

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

Construct a line graph for the data.
15) The ages of employees of a company are summarized in the frequency table.

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24</td>
<td>11</td>
</tr>
<tr>
<td>25-31</td>
<td>38</td>
</tr>
<tr>
<td>32-38</td>
<td>35</td>
</tr>
<tr>
<td>39-45</td>
<td>27</td>
</tr>
<tr>
<td>46-52</td>
<td>22</td>
</tr>
<tr>
<td>53-59</td>
<td>14</td>
</tr>
<tr>
<td>60-66</td>
<td>5</td>
</tr>
</tbody>
</table>
### D) None of the above

#### 16) Weight of Cats

<table>
<thead>
<tr>
<th>Weight (lb)</th>
<th>Number of Cats</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-7</td>
<td>2</td>
</tr>
<tr>
<td>8-10</td>
<td>9</td>
</tr>
<tr>
<td>11-13</td>
<td>18</td>
</tr>
<tr>
<td>14-16</td>
<td>13</td>
</tr>
<tr>
<td>17-19</td>
<td>4</td>
</tr>
<tr>
<td>20-22</td>
<td>1</td>
</tr>
</tbody>
</table>
Solve the problem.

17) The total yearly food bill for a family of four is $8589.88. To the nearest cent, what is the mean weekly food bill?
A) $23.53  B) $171.80  C) $165.19  D) $159.07

18) Use the graph to determine how many hours were needed to prepare for Test 2.
A) 2  B) 5  C) 1  D) 3
19) Bill kept track of the number of hours he spent exercising each week. The results for four months are shown below. Find the mean number of hours Bill spent exercising per week. Round your answer to two decimal places.

8.40 8.70 8.90 8.70 6.80 8.40
8.70 8.90 6.60 8.40 8.70 6.60
8.00 8.70 7.20 6.80 8.70

A) 8.11 B) 7.68 C) 8.34 D) 8.58

20) Six college buddies bought each other Christmas gifts. They spent $195.73, $227.30, $213.27, $259.38, $263.02, and $177.68. Find the mean amount spent for Christmas gifts.

A) $334.10 B) $222.73 C) $267.28 D) $255.28

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

21) Here are the summary statistics for mathematics scores for one high-school graduating class, and the parallel boxplots comparing the scores of male and female students. Write a brief report on these results. Be sure to discuss shape, center, and spread of the scores.

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
<th>Q1</th>
<th>Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>17</td>
<td>60</td>
<td>63</td>
<td>18.6</td>
<td>30</td>
<td>100</td>
<td>52</td>
<td>78</td>
</tr>
<tr>
<td>Female</td>
<td>18</td>
<td>65</td>
<td>66</td>
<td>17.7</td>
<td>36</td>
<td>98</td>
<td>50</td>
<td>80</td>
</tr>
</tbody>
</table>

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

22) The mean height of 5 students is 61.8. If one of the students leaves, the mean height becomes 60. What is the height of the absent student?

A) 66 B) 70 C) 69 D) 72

23) The Wellspring Company’s fleet of trucks get 16, 10, 17, 13, 20, 8, and 21 miles per gallon. What is the mean miles per gallon for the fleet? Round to the nearest whole number.

A) 18 B) 15 C) 14 D) 12

24) Liz ran 21 mi, 19 mi, and 27 mi during three weeks. How many miles must she run the fourth week to give her an average of 20 miles per week?

A) 21.8 miles B) 13 miles C) 22.3 miles D) 20 miles
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

25) Here are boxplots of the points scored during the first 10 games of the basketball season for both Caroline and Alexandra. Summarize the similarities and differences in their performance so far.

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

26) The mean math score for the 40 students from Lowell High School is 68. The mean score for the 20 students from Burwook Park School is 84. The mean score for the 20 students from Skyline School is 69. The mean score for the 20 students from Shaughnessy High School is 89. What is the mean score for all 100 students?
A) 75.6  
B) 78.8  
C) 77.5  
D) 74.3

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

27) The data below are the gestation periods, in months, of randomly selected animals and their corresponding life spans, in years. Construct a scatter plot for the data. Determine whether there is a positive linear correlation, a negative linear correlation, or no linear correlation. Use the scatterplot to estimate the life span for an animal having a gestation period of 18 months.

<table>
<thead>
<tr>
<th>Gestation, x</th>
<th>8</th>
<th>2.1</th>
<th>1.3</th>
<th>1</th>
<th>11.5</th>
<th>5.3</th>
<th>3.8</th>
<th>24.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life span, y</td>
<td>30</td>
<td>12</td>
<td>6</td>
<td>3</td>
<td>25</td>
<td>12</td>
<td>10</td>
<td>40</td>
</tr>
</tbody>
</table>

28) Construct a scatter plot for the given data. Determine whether there is a positive linear correlation, negative linear correlation, or no linear correlation.

<table>
<thead>
<tr>
<th>x</th>
<th>-5</th>
<th>-3</th>
<th>4</th>
<th>1</th>
<th>-1</th>
<th>-2</th>
<th>0</th>
<th>2</th>
<th>3</th>
<th>-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>11</td>
<td>-6</td>
<td>8</td>
<td>-3</td>
<td>-2</td>
<td>1</td>
<td>5</td>
<td>-5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
Use the given data to construct a frequency table.

29) A car insurance company conducted a survey to find out how many car accidents people had been involved in. They selected a sample of 40 adults between the ages of 30 and 70 and asked each person how many accidents they had been involved in in the past ten years. The following data were obtained.

<table>
<thead>
<tr>
<th>Number of accidents</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

Construct a frequency table for the number of car accidents. Use single values for each class.

<table>
<thead>
<tr>
<th>Number of accidents</th>
<th>Frequency</th>
<th>Relative Frequency</th>
</tr>
</thead>
</table>

30) The following data represent the total number of years of formal education for 40 employees of a bank.

<table>
<thead>
<tr>
<th>Number of years of education</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td>17</td>
<td>16</td>
</tr>
</tbody>
</table>

Construct a frequency table for the number of years of education. Use single values for each class.

<table>
<thead>
<tr>
<th>Number of years of education</th>
<th>Frequency</th>
<th>Relative Frequency</th>
</tr>
</thead>
</table>

Identify the misuse or misrepresentation of statistics.

31) Criticize this statement: "Last year, Americans consumed 121,358,399,451 gallons of gasoline."

31) ________________
32) There is a strong positive correlation between the number of visits to a therapist and the number of vacations taken last year. So, if you want more vacations, you should see your therapist more often.

33) 60% of those attending the folk festival said that they prefer to buy organic food. So, most Americans prefer to buy organic food.

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

Find the median for the given sample data.
34) {3, 4, 9, 10, 15}  
   A) 9  B) 6.5  C) 7.2  D) 8.2

35) {17, 28, 36, 51, 63, 67, 88}  
   A) 63  B) 36  C) 50  D) 51

36) {84, 36, 224, 143, 278, 241, 238}  
   A) 224  B) 238  C) 143  D) 178

Answer the question.
37) What type of correlation is there for the data shown in the scatterplot below?

A) Positive correlation  B) Negative correlation  C) No correlation
38) The following scatterplot displays temperatures recorded in various locations at different latitudes on a particular summer day.

What type of correlation is there for this data?
A) Positive correlation  B) Negative correlation  C) No correlation

39) The following scatterplot shows heights (in inches) of children and their ages.

What type of correlation is there for this data?
A) Positive correlation  B) Negative correlation  C) No correlation

Find the mean of the data.
40) \{4, 5, 7, 10\}
Round to the nearest tenth.
A) 6.5  B) 5.3  C) 6  D) 6
41) \{3, 6, 15, 16, 6\}
Round to the nearest tenth.
A) 10 B) 8.2 C) 9.2 D) 6

42) The test scores of 20 students are shown below:

| 65 | 76 | 82 | 77 | 67 | 92 | 63 | 85 | 97 | 89 |
| 79 | 71 | 50 | 91 | 85 | 77 | 85 | 79 | 18 | 89 |

Find the mean. Round to the nearest hundredth.
A) 66.80 B) 75.85 C) 79.05 D) 75

Use the figure to answer the question.
43) The weights (in pounds) of a group of high school students are listed below in a stem-and-leaf plot.

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

Which interval has the most students in it?
A) 90–99 B) 140–149 C) 130–139 D) 110–119

44) The weights (in pounds) of a group of high school students are listed below in a stem-and-leaf plot.

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

What is the difference between the lowest and highest weights?
A) 53 B) 60 C) 98 D) 61

Find the range of the data set.
45) \{11.3, 7.3, 8.8, 6.4, 9.2\}
A) 8.1 B) 11.3 C) 8.9 D) 4.9

46) \{15, 17, 14, 26, 35, 16\}
A) 12 B) 20 C) 25 D) 50

47) \{14, 28, 63, 41, 50, 70\}
A) 84 B) 41 C) 56 D) 42
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Use the given data to construct a stem–and–leaf plot.
   48) The diastolic blood pressures for a sample of patients at a clinic were as follows. The
   values are in mmHg.
   
   78  87  91  85  97  102  73  90  110  105
   94  85  81  95  77  106  84  111  83  92
   79  81  96  88  100  85  89  101  83  120
   88  95  78  74  105  85  87  92  114  83

   \[ 48) \text{___________} \]

   49) The scores for a statistics test are as follows:
   
   87  76  97  77  98  94  88  85  66  89
   79  95  51  90  83  88  82  52  11  69

   \[ 49) \text{___________} \]

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

Construct the specified bar graph to illustrate the given data.
   50) The following table shows the number of people attending a certain jazz festival in
   various years. Create a vertical bar graph to illustrate the data.

   \[
   \begin{array}{|c|c|}
   \hline
   \text{Year} & \text{Visitors (in thousands)} \\
   \hline
   1981 & 240 \\
   1991 & 340 \\
   2001 & 400 \\
   2003 & 460 \\
   \hline
   \end{array}
   \]

   \[ 50) \text{___________} \]
51) Create a vertical bar graph to illustrate the data in the table below.

<table>
<thead>
<tr>
<th>Entree Choices of Customers During One Year</th>
<th>Number of Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grilled Salmon</td>
<td>3500</td>
</tr>
<tr>
<td>Chicken Salad</td>
<td>4000</td>
</tr>
<tr>
<td>Beef Stew</td>
<td>3000</td>
</tr>
<tr>
<td>Ham Pie</td>
<td>4500</td>
</tr>
<tr>
<td>Bacon Burger</td>
<td>3750</td>
</tr>
<tr>
<td>Cheese Pizza</td>
<td>2250</td>
</tr>
</tbody>
</table>

52) The line graph below shows the high closing values of Naristar Inc. stock from the years 1990 – 2001. $x = 0$ represents 1990, $x = 1$ represents 1991 and so on.
53) The circle graph shows the cause of death for one state in the year 2002.

54) The following stem-and-leaf display shows the scores for 20 students on an exam. The lower stem contains leaves with the digits 0–4 and the upper stem contains leaves with digits 5–9.

Exam Scores
9 | 6 6 6 6 6 7 8 9
9 | 0 1 2 2
8 | 7 8 9 10
8 | 7 8
7 | 6
6 | 0 4
5 | 

Key:
9 | 1 = 91%

55) The mathematics department at a community college collected data for the number of students enrolled in 40 math courses over the course of one year. The following stem-and-leaf display shows the total number of students enrolled in each class.

Class Size Totals
12 | 6 7 7
11 | 8 9
10 | 0 2 5 7
9 | 1 3 5 7
8 | 0 0 3 7 7
7 | 2 5 7
6 | 2 2 3 5 9
5 | 3 3 8 9
4 | 2 3 3 6 6
3 | 6 6 7 8 9

Key:
10 | 5 = 105 students
56) The circle graph shows the cause of death for one state in the year 2002.

Use the given data to construct a line graph.
57) The data in the table represent production figures for the United States.

Canned Fruit, 1970–1977

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>106.5</td>
<td>97.7</td>
<td>84.8</td>
<td>96.1</td>
<td>101.5</td>
<td>90.2</td>
<td>88.5</td>
<td>90.8</td>
</tr>
</tbody>
</table>

58) The data in the table represent production figures for the United States.

Cotton, 1970–1976

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bushels</td>
<td>10.2</td>
<td>10.5</td>
<td>13.7</td>
<td>13.0</td>
<td>11.5</td>
<td>8.3</td>
<td>10.6</td>
</tr>
</tbody>
</table>

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

Use the circle graph to solve the problem.
59) In a school survey, students showed these preferences for instructional materials.

About how many students would you expect to prefer radio in a school of 450 students?
A) About 162  B) About 81  C) About 5  D) About 23
Calculate the interquartile range.

60) The following scores on the midterm exam in Chemistry 102 were recorded:

93  81  59  69  82  73  61  77  95  84  88  71
86  97  63  72  89  80  60  98  91  62  78  83
76  81  94  66  83  96

Find the interquartile range (IQR).
A) 19  B) 18  C) 13  D) 15

61) The semester point totals of 16 students are listed below. Find the interquartile range (IQR).

787  639  820  677
475  601  531  650
583  684  875  507
599  460  543  490

A) 170  B) 161.5  C) 601  D) 297  E) 599

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

Draw a pictograph that represents the data.

62) The following chart shows Nation X's tiger population in various years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Tiger Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>99</td>
</tr>
<tr>
<td>1989</td>
<td>27</td>
</tr>
<tr>
<td>1988</td>
<td>66</td>
</tr>
<tr>
<td>1987</td>
<td>170</td>
</tr>
<tr>
<td>1986</td>
<td>285</td>
</tr>
<tr>
<td>1985</td>
<td>377</td>
</tr>
</tbody>
</table>

Use the symbol 🦁 to represent 30 tigers.
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Construct a box-and-whisker plot for the set of data.
63) \{5, 3, 10, 12, 8, 18, 5, 10, 4, 15, 6, 4\}

63) ____

64) \{20, 30, 40, 25, 35, 22, 50, 42, 32, 45, 55, 52\}

64) ____

Find the mode for the given data.
65) \{-10, -4, 6, 10\}

65) ____

66) Find the mode of these downtime hours:
18, 4, 5, 8, 11, 18, 5, 18

A) two modes 5 and 18
B) none
C) 9.5
D) 18

66) ____
Determine which types of display could be used to illustrate the given data.

67) A local park district is planning to build a recreation center. The park district conducted a poll to find out the types of physical activities the local population would be interested in. The poll was based on telephone responses from 1013 randomly selected adults. The table shows the percentages of people who expressed interest in various activities.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percent Interested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Running/Walking</td>
<td>54</td>
</tr>
<tr>
<td>Weight Training</td>
<td>47</td>
</tr>
<tr>
<td>Biking</td>
<td>32</td>
</tr>
<tr>
<td>Aerobics</td>
<td>25</td>
</tr>
<tr>
<td>Swimming</td>
<td>14</td>
</tr>
</tbody>
</table>

Which of the following displays is/are appropriate for these data? (More than one display may be appropriate.)
I) Circle graph
II) Bar graph
III) Histogram
IV) Stem-and-leaf plot
A) II, IV  B) I, II  C) II  D) None of them

68) The midterm test scores for the seventh-period typing class are listed below.

85 77 93 91 74 65 68 97 88 85 74 83 85 72 63 79

Which of the following types of display could be used to illustrate this data?
I) Histogram
II) Stem-and-Leaf Plot
III) Bar Graph
IV) Circle Graph
A) II, III  B) II  C) I, IV  D) I, II

69) The Centers for Disease Control lists causes of death for individual states in 2002. The mortality data for one state is given.

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Disease</td>
<td>27.1</td>
</tr>
<tr>
<td>Cancer</td>
<td>22.9</td>
</tr>
<tr>
<td>Circulatory diseases and stroke</td>
<td>7.3</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>5.4</td>
</tr>
<tr>
<td>Accidents</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Which of the following types of display could be used to illustrate this data?
I) Histogram
II) Bar Graph
III) Circle Graph
IV) Stem-and-leaf plot
A) I, III  B) I, II, III  C) II, IV  D) II, III
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Construct a circle graph for the given data.

70) The following table gives the distribution of land (in acres) for a county containing 79,000 acres.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest</td>
<td>11,850</td>
<td>15</td>
</tr>
<tr>
<td>Farm</td>
<td>7900</td>
<td>10</td>
</tr>
<tr>
<td>Urban</td>
<td>59,250</td>
<td>75</td>
</tr>
</tbody>
</table>

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

Find the midrange for the given sample data.

71) A meteorologist records the number of clear days in a given year in each of 21 different U.S. cities. The results are shown below. Find the midrange.

72 143 52 84 100 98 101
120 99 121 86 60 59 71
125 130 104 74 83 55 169
A) 112  B) 98  C) 117  D) 110.5

72) The weights (in ounces) of 18 cookies are shown. Find the midrange.

0.75 1.32 0.93 1.00 0.77 1.44
1.32 1.23 0.75 1.45 1.33 1.19
1.33 1.45 0.77 1.33 1.00 0.93
A) 1.095  B) 1.110  C) 1.19  D) 1.100

73) \{49, 52, 52, 52, 74, 67, 55, 55\}
A) 25  B) 53.5  C) 61.5  D) 12.5

The bar graph below shows the number of students by major in the College of Arts and Sciences. Answer the question.

74) What is the ratio of science majors to the total number of students in the college?
A) 49 to 16  B) 6 to 7  C) 1 to 7  D) 6 to 49

75) What percent of students are history and science majors (to the nearest tenth of a percent)?
A) 38.9%  B) 57.1%  C) 28.6%  D) 36.7%
1) Answers will vary. Possible answer: The range will be unaffected, while the standard deviation will increase. The standard deviation is often preferable as it takes all observations into account while the range depends only on the smallest and largest observations and disregards other observations.
   ID: MEST4O 8.3.15-4
   Objective: (8.3) *Know Concepts: Average and Spread II

2) Median: $705
The mean will be larger because of the two unusually large values.
The median is the most appropriate measure of center, as it is more representative of the majority of salaries. The mean is less representative as it is affected by the extreme values and is "pulled up" by the two outliers.
   ID: MEST4O 8.3.14-4
   Objective: (8.3) *Know Concepts: Average and Spread I

3) Answers will vary. Possible answer: No, the standard deviation is 31.9. This is not a good indication of the typical deviation from the mean because the data set contains an extreme observation, namely 100. The standard deviation is very sensitive to extreme observations.
   ID: MEST4O 8.3.15-6
   Objective: (8.3) *Know Concepts: Average and Spread II

4) Answers will vary. Possible answer: It would be to the teacher’s advantage to lengthen the scale of the vertical axis. This would emphasize changes in the vertical variable – final grade. The downward trend of the points would be steeper suggesting a larger decrease in final grade for each missed class.
   ID: MEST4O 8.2.7-4
   Objective: (8.2) *Know Concepts: Displays That Show Relationships

5) A
   ID: MEST4O 8.3.10-2
   Objective: (8.3) Solve Apps: Use Box-and-Whisker Plots

6) It would be better for Jill if the teacher used her median score (90) as this would be unaffected by her one unusually low score of 33. The mean is sensitive to outliers and would be "pulled down" by the unusually low score. The mean score in this case is 82.4 which is not so representative of the majority of Jill’s scores.
   ID: MEST4O 8.3.14-2
   Objective: (8.3) *Know Concepts: Average and Spread I

7) Lengthening the scale of the vertical axis emphasizes changes in the vertical variable – the closing value of the stock. Each line segment would be steeper suggesting a larger change (increase or decrease) in the value of the stock for the year.
   ID: MEST4O 8.2.7-1
   Objective: (8.2) *Know Concepts: Displays That Show Relationships

8) B
   ID: MEST4O 8.3.10-5
   Objective: (8.3) Solve Apps: Use Box-and-Whisker Plots

9) The mean, median, and mode will increase by m. The range, standard deviation, and variance will be unaffected.
   ID: MEST4O 8.3.15-1
   Objective: (8.3) *Know Concepts: Average and Spread II

10) The mode. The data (winning country) is qualitative. Since the data are not numerical values, it is not possible to find the median or mean, only the most frequently occurring value (i.e. the mode).
   ID: MEST4O 8.3.14-8
   Objective: (8.3) *Know Concepts: Average and Spread I

11) B
   ID: MEST4O 8.1.2-7
   Objective: (8.1) Create or Interpret Dot Plot

12) The bars are not drawn in the correct proportions.
   ID: MEST4O 8.4.2-2
   Objective: (8.4) *Identify Misuse of Graph
13) D  
ID: MEST4O 8.1.2-4  
Objective: (8.1) Create or Interpret Dot Plot

14) Answers will vary. Possible answer: The graph is misleading because it is truncated. The scale on the vertical axis should start at zero so that the bars will be in the correct proportions. A part of the vertical axis could be omitted but the symbol // should then be used to warn the reader of the modified axis.  
ID: MEST4O 8.4.2-3  
Objective: (8.4) *Identify Misuse of Graph

15) C  
ID: MEST4O 8.2.2-3  
Objective: (8.2) Solve Apps: Construct Line Graph II

16) A  
ID: MEST4O 8.2.2-1  
Objective: (8.2) Solve Apps: Construct Line Graph II

17) C  
ID: MEST4O 8.3.12-9  
Objective: (8.3) Solve Apps: Find Mean

18) D  
ID: MEST4O 8.2.3-2  
Objective: (8.2) Solve Apps: Interpret Line Graph

19) A  
ID: MEST4O 8.3.12-7  
Objective: (8.3) Solve Apps: Find Mean

20) B  
ID: MEST4O 8.3.12-2  
Objective: (8.3) Solve Apps: Find Mean

21) The median score of females (66) is 3 points higher than that of males, and the mean for females is 5 points higher. The middle 50% for both group is close with a IQR at 26 for the males and 30 for the females. The males have a slightly larger range. The distribution is slightly right-skewed for the males and symmetric for the females.  
ID: MEST4O 8.3.11-5  
Objective: (8.3) *Use Boxplots to Compare Distributions

22) C  
ID: MEST4O 8.3.13-8  
Objective: (8.3) Solve Apps: Use Mean/Range/Median

23) B  
ID: MEST4O 8.3.12-4  
Objective: (8.3) Solve Apps: Find Mean

24) B  
ID: MEST4O 8.3.13-4  
Objective: (8.3) Solve Apps: Use Mean/Range/Median

25) Both girls have a median score of about 18 points per game. Caroline is much more consistent, because her IQR is about 4 points, while Alexandra’s is over 15.  
ID: MEST4O 8.3.11-3  
Objective: (8.3) *Use Boxplots to Compare Distributions

26) A  
ID: MEST4O 8.3.13-11  
Objective: (8.3) Solve Apps: Use Mean/Range/Median
27) There appears to be a positive linear correlation. Estimated life span for an animal having a gestation period of 18 months is about 35 years.

ID: MEST4O 8.2.6-1
Objective: (8.2) *Solve Apps: Construct/Use Scatterplot

28) There appears to be no linear correlation.

ID: MEST4O 8.2.6-3
Objective: (8.2) *Solve Apps: Construct/Use Scatterplot

29)

<table>
<thead>
<tr>
<th>Number of accidents</th>
<th>Frequency</th>
<th>Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>13</td>
<td>32.5%</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>30%</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>15%</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>7.5%</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>5%</td>
</tr>
</tbody>
</table>

ID: MEST4O 8.1.1-1
Objective: (8.1) *Construct Frequency Distribution Given Data
30) The number of years of education is given in the table below:

<table>
<thead>
<tr>
<th>Number of Years of Education</th>
<th>Frequency</th>
<th>Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>1</td>
<td>2.5%</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>7.5%</td>
</tr>
<tr>
<td>13</td>
<td>11</td>
<td>27.5%</td>
</tr>
<tr>
<td>14</td>
<td>5</td>
<td>12.5%</td>
</tr>
<tr>
<td>15</td>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td>16</td>
<td>3</td>
<td>7.5%</td>
</tr>
<tr>
<td>17</td>
<td>8</td>
<td>20%</td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>19</td>
<td>3</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

ID: MEST4O 8.1.1-2
Objective: (8.1) *Construct Frequency Distribution Given Data

31) The number suggests that a very accurate and precise count was taken, but it is actually an estimate. The precision of the number is unwarranted and deceptive. It would be better to say that "121 billion gallons of gasoline were consumed."
ID: MEST4O 8.4.1-4
Objective: (8.4) *Identify Misuse or Misrepresentation of Statistics

32) Correlation does not imply causality. The correlation exists because both the number of visits to a therapist and the number of vacations depend on income – people with higher incomes tend to see a therapist more and to take more vacations.
ID: MEST4O 8.4.1-2
Objective: (8.4) *Identify Misuse or Misrepresentation of Statistics

33) Bias results from collecting data at a folk festival. Those attending a folk festival are not representative of all Americans.
ID: MEST4O 8.4.1-3
Objective: (8.4) *Identify Misuse or Misrepresentation of Statistics

34) A
ID: MEST4O 8.3.2-1
Objective: (8.3) Find Median

35) D
ID: MEST4O 8.3.2-3
Objective: (8.3) Find Median

36) A
ID: MEST4O 8.3.2-6
Objective: (8.3) Find Median

37) C
ID: MEST4O 8.2.5-3
Objective: (8.2) Interpret Scatterplot

38) B
ID: MEST4O 8.2.5-1
Objective: (8.2) Interpret Scatterplot

39) A
ID: MEST4O 8.2.5-2
Objective: (8.2) Interpret Scatterplot

40) A
ID: MEST4O 8.3.1-1
Objective: (8.3) Find Mean
Answer Key
Testname: 3161-PRACTICE-TEST-8_1-8_4

41) C
   ID: MEST4O 8.3.1-3
   Objective: (8.3) Find Mean

42) B
   ID: MEST4O 8.3.1-7
   Objective: (8.3) Find Mean

43) C
   ID: MEST4O 8.1.10-3
   Objective: (8.1) Solve Apps: Use Stem-and-Leaf Plot

44) D
   ID: MEST4O 8.1.10-4
   Objective: (8.1) Solve Apps: Use Stem-and-Leaf Plot

45) D
   ID: MEST4O 8.3.5-7
   Objective: (8.3) Find Range

46) B
   ID: MEST4O 8.3.5-4
   Objective: (8.3) Find Range

47) C
   ID: MEST4O 8.3.5-1
   Objective: (8.3) Find Range

48)

<table>
<thead>
<tr>
<th>7</th>
<th>3 4 7 8 8 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>1 1 3 3 4 5 5 5 5 7 8 8 9</td>
</tr>
<tr>
<td>9</td>
<td>0 1 2 2 4 5 5 6 7</td>
</tr>
<tr>
<td>10</td>
<td>0 1 2 5 5 6</td>
</tr>
<tr>
<td>11</td>
<td>0 1 4</td>
</tr>
<tr>
<td>12</td>
<td>0</td>
</tr>
</tbody>
</table>

ID: MEST4O 8.1.3-5
Objective: (8.1) *Construct Stem-and-Leaf Plot

49)

<table>
<thead>
<tr>
<th>1</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1 2</td>
</tr>
<tr>
<td>6</td>
<td>6 9</td>
</tr>
<tr>
<td>7</td>
<td>6 7 9</td>
</tr>
<tr>
<td>8</td>
<td>7 8 5 9 3 8 2</td>
</tr>
<tr>
<td>9</td>
<td>7 8 4 5 0</td>
</tr>
</tbody>
</table>

ID: MEST4O 8.1.3-6
Objective: (8.1) *Construct Stem-and-Leaf Plot
50) Number Attending Jazz Festival

![Bar Graph](image)

ID: MEST4O 8.1.7-2
Objective: (8.1) *Construct Bar Graph

51) Entree Choices of Customers During One Year

![Bar Graph](image)

ID: MEST4O 8.1.7-1
Objective: (8.1) *Construct Bar Graph


ID: MEST4O 8.4.3-1
Objective: (8.4) *Interpret Visual Display

53) Answers will vary. Possible answer: The category "other" is quite large indicating that a substantial percentage (roughly 33%) of people died of a cause other than heart disease, cancer, circulatory diseases, respiratory diseases, and accidents. Heart disease is the most common cause of death, and cancer is the second most common cause. Together these two causes account for a little more than 50% of deaths. Other causes are much less common, with circulatory diseases and stroke being the third most common category.

ID: MEST4O 8.1.14-2
Objective: (8.1) *Interpret Display

54) Answers will vary. Possible answer: The distribution of exam scores is skewed to the left. Many students scored in the high 90s. Almost all scores are in the upper eighties or nineties. The few students who scored much less account for the tail to the left. Two of these scores are outliers, scores below 65%. These two scores are unusually low compared to the other scores.

ID: MEST4O 8.1.14-5
Objective: (8.1) *Interpret Display
55) Answers will vary. Possible answer: The distribution of the number of students enrolled in each of the 40 math courses is roughly uniform over the interval 36 to 127. The smallest class size was 36 and the largest was 127. The number of classes in each of the intervals (30-39, 40-49, ... etc) was roughly equal

ID: MEST4O 8.1.14-4
Objective: (8.1) *Interpret Display

56) Answers will vary. Possible answer: The category "other" is quite large indicating that a substantial percentage (roughly 33%) of people died of a cause other than heart disease, cancer, circulatory diseases, respiratory diseases, and accidents. Heart disease is the most common cause of death, and cancer is the second most common cause. Together these two causes account for a little more than 50% of deaths. Other causes are much less common, with circulatory diseases and stroke being the third most common category.

ID: MEST4O 8.4.3-3
Objective: (8.4) *Interpret Visual Display

57) 

ID: MEST4O 8.2.1-1
Objective: (8.2) *Solve Apps: Construct Line Graph

58) 

ID: MEST4O 8.2.1-3
Objective: (8.2) *Solve Apps: Construct Line Graph

59) D

ID: MEST4O 8.1.8-6
Objective: (8.1) Solve Apps: Use Circle Graph

60) B

ID: MEST4O 8.3.8-2
Objective: (8.3) Find Interquartile Range

61) B

ID: MEST4O 8.3.8-1
Objective: (8.3) Find Interquartile Range
62)  

<table>
<thead>
<tr>
<th>Year</th>
<th>Tiger Population of Nation X</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>🐯🐯🐯 1</td>
</tr>
<tr>
<td>1989</td>
<td>🐯</td>
</tr>
<tr>
<td>1988</td>
<td>🐯🐯 1</td>
</tr>
<tr>
<td>1987</td>
<td>🐯🐯🐯🐯 1</td>
</tr>
<tr>
<td>1986</td>
<td>🐯🐯🐯🐯🐯🐯🐯🐯🐯 1</td>
</tr>
<tr>
<td>1985</td>
<td>🐯🐯🐯🐯🐯🐯🐯🐯🐯 1</td>
</tr>
</tbody>
</table>

颏 = 30 tigers  
ID: MEST4O 8.1.5-4  
Objective: (8.1) *Construct Pictograph

63) A  
ID: MEST4O 8.3.9-1  
Objective: (8.3) Draw Box-and-Whisker Plot

64) D  
ID: MEST4O 8.3.9-2  
Objective: (8.3) Draw Box-and-Whisker Plot

65) A  
ID: MEST4O 8.3.3-4  
Objective: (8.3) Find Mode

66) D  
ID: MEST4O 8.3.3-5  
Objective: (8.3) Find Mode

67) C  
ID: MEST4O 8.1.13-5  
Objective: (8.1) Determine Appropriate Display

68) D  
ID: MEST4O 8.1.13-1  
Objective: (8.1) Determine Appropriate Display

69) D  
ID: MEST4O 8.1.13-4  
Objective: (8.1) Determine Appropriate Display
ID: MEST4O 8.1.6-4
Objective: (8.1) *Construct Circle Graph

71) D
ID: MEST4O 8.3.4-7
Objective: (8.3) Find Midrange

72) D
ID: MEST4O 8.3.4-5
Objective: (8.3) Find Midrange

73) C
ID: MEST4O 8.3.4-1
Objective: (8.3) Find Midrange

74) D
ID: MEST4O 8.1.9-7
Objective: (8.1) Solve Apps: Use Bar Graph

75) D
ID: MEST4O 8.1.9-4
Objective: (8.1) Solve Apps: Use Bar Graph