Ch. 2-3 Test Review Lab

Name___________________________________

Construct the specified histogram.

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

<table>
<thead>
<tr>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>97 96 96 95 96</td>
</tr>
<tr>
<td>99 97 97 100 99</td>
</tr>
<tr>
<td>95 98 95 96 100</td>
</tr>
<tr>
<td>95 98 96 96 100</td>
</tr>
<tr>
<td>95 97 99 97 98</td>
</tr>
</tbody>
</table>

1) ____________

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

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

2) ____________
Provide an appropriate response.

3) For the distribution drawn here, identify the mean, median, and mode.
   A) A = mode, B = mean, C = median        B) A = median, B = mode, C = mean
   C) A = mean, B = mode, C = median        D) A = mode, B = median, C = mean

4) Find the z-score for the value 87, when the mean is 92 and the standard deviation is 5.
   A) z = -0.89        B) z = -1.20        C) z = 0.89        D) z = -1.00

5) True or False: Variance is the square root of standard deviation.
   A) True        B) False

6) When results from a scholastic assessment test are sent to test-takers, the percentiles associated with their scores are also given. Suppose a test-taker scored at the 85th percentile for their verbal grade and at the 34th percentile for their quantitative grade. Interpret these results.
   A) This student performed better than 85% of the other test-takers in the verbal part and better than 34% in the quantitative part.
   B) This student performed better than 15% of the other test-takers in the verbal part and better than 66% in the quantitative part.
   C) This student performed better than 15% of the other test-takers in the verbal part and better than 34% in the quantitative part.
   D) This student performed better than 85% of the other test-takers in the verbal part and better than 66% in the quantitative part.

7) A student scores 74 on a geography test and 285 on a mathematics test. The geography test has a mean of 80 and a standard deviation of 5. The mathematics test has a mean of 300 and a standard deviation of 10. If the data for both tests are normally distributed, on which test did the student score better relative to the other students in each class?
   A) The student scored better on the geography test.
   B) The student scored the same on both tests.
   C) The student scored better on the mathematics test.

8) The commute times (in minutes) of 30 employees are listed below. Find $Q_2$.
   31 41 45 48 52 55 56 56 63 65
   67 67 69 70 74 75 78 79 79
   80 81 83 85 87 90 92 95 99
   A) 88 min        B) 72 min        C) 83 min        D) 71 min
9) A severe drought affected several western states for 3 years. A Christmas tree farmer is worried about the drought's effect on the size of his trees. To decide whether the growth of the trees has been retarded, the farmer decides to take a sample of the heights of 25 trees and obtains the following results (recorded in inches):

60  57  62  69  46  54  64  60  59  58  75  51  49  67  65  44  58  55  48  62  63  73  52  55  50

The tree farmer feels the normal height of a tree that was unaffected by the drought would be 65 inches. Find the z-score for a tree that is 65 inches tall.

A) $z = 0.98$  B) $z = 0.77$  C) $z = 0.98$  D) $z = 0.84$

10) Each year advertisers spend billions of dollars purchasing commercial time on network sports television. In the first 6 months of 1988, advertisers spent $1.1 billion. Who were the largest spenders? In a recent article, listed the top 10 leading spenders (in million of dollars):

<table>
<thead>
<tr>
<th>Company</th>
<th>Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>70.9</td>
</tr>
<tr>
<td>F</td>
<td>27.7</td>
</tr>
<tr>
<td>B</td>
<td>60.5</td>
</tr>
<tr>
<td>G</td>
<td>24.6</td>
</tr>
<tr>
<td>C</td>
<td>57.4</td>
</tr>
<tr>
<td>H</td>
<td>22.3</td>
</tr>
<tr>
<td>D</td>
<td>55.2</td>
</tr>
<tr>
<td>I</td>
<td>23.1</td>
</tr>
<tr>
<td>E</td>
<td>28.8</td>
</tr>
<tr>
<td>J</td>
<td>19.7</td>
</tr>
</tbody>
</table>

Calculate the sample variance.

A) 39.02  B) 19.51  C) 51.20  D) 380.46

11) To study the physical fitness of a sample of 28 people, the data below were collected representing the number of sit-ups that a person could do in one minute.

<table>
<thead>
<tr>
<th>10</th>
<th>12</th>
<th>12</th>
<th>15</th>
<th>15</th>
<th>15</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>22</td>
<td>25</td>
<td>25</td>
<td>26</td>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td>32</td>
<td>33</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>45</td>
<td>46</td>
</tr>
<tr>
<td>47</td>
<td>48</td>
<td>48</td>
<td>50</td>
<td>52</td>
<td>53</td>
<td>56</td>
</tr>
</tbody>
</table>

Determine the lower and upper fences. Are there any outliers according to this criterion?

12) The costs (in dollars) of 10 college math textbooks are listed below. Find the sample standard deviation.

70  72  71  70  69  73  69  68  70  71

A) $5.00  B) $70.30  C) $1.49  D) $2.23

13) The heights of ten female students (in inches) in a college math class are listed below. Find the mean.

65  66  67  66  67  70  67  70  71  68

A) 70.0 inches  B) 65.5 inches  C) 71.1 inches  D) 67.7 inches
14) Health care issues are receiving much attention in both academic and political arenas. A sociologist recently conducted a survey of senior citizens whose net worth is too high to qualify for government health care but who have no private health insurance. The ages of 25 uninsured senior citizens were as follows:

71 76 69 79 89 77 64 92 68 93 72 95 79 65 84 66 71 84 73 76 63 90 78 67 85

Find Q₁ of the data.
A) 76.5  B) 68  C) 68.5  D) 69

15) The average score of local students on a college entrance exam is 110, with a standard deviation of 5. The distribution is roughly bell shaped. Use the Empirical Rule to find the percentage of local students with scores above 120.
A) 2.5%  B) 95%  C) 97.5%  D) 5%

16) The 1995 payroll amounts for all major-league baseball teams are shown below. What percentage of the payrolls were in the $40–$50 million range?

1995 Payroll of Baseball Teams (in millions of dollars)

A) 19%  B) 5%  C) 4%  D) 23%

17) The one way distances from work (in miles) of 30 employees are listed below. Find the interquartile range of the 30 distances listed below.

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

18) Given the following five-number summary, find the interquartile range.

29, 37, 50, 66, 94
A) 50  B) 65  C) 32.5  D) 29
19) Test scores for a statistics class had a mean of 79 with a standard deviation of 4.5. Test scores for a calculus class had a mean of 69 with a standard deviation of 3.7. Suppose a student gets a 71 on the statistics test and a 97 on the calculus test. Calculate the z-score for each test. On which test did the student perform better relative to the other students in each class?

20) The percentage of measurements that are above the 39th percentile is
   A) 61%
   B) 39%
   C) 71%
   D) cannot determine

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

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

22) Describe the shape of the histogram. The data set: age of 20 household stereo systems randomly selected from a neighborhood

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>6</td>
<td>4</td>
<td>9</td>
<td>11</td>
<td>1</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>13</td>
<td>15</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

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

23) Health care issues are receiving much attention in both academic and political arenas. A sociologist recently conducted a survey of citizens over 60 years of age whose net worth is too high to qualify for government health care but who have no private health insurance. The ages of 25 uninsured senior citizens were as follows:

68  73  66  76  86  74  61  89  65  90  69  92  76
62  81  63  68  81  70  73  60  87  75  64  82

Suppose the mean and standard deviation are 74.0 and 9.7, respectively. If we assume that the distribution of ages is bell shaped, what percentage of the respondents will be between 64.3 and 93.4 years old?

A) approximately 81.5%
B) approximately 83.9%
C) approximately 68%
D) approximately 95%

24) In distributions that are skewed to the right, what is the relationship of the mean, median, and mode?

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

25) The number of students enrolled in a physics class for the last ten semesters are listed below. Find the median number of students.

65  66  67  66  67  70  67  70  71  68

A) 66 students
B) 67 students
C) 70 students
D) 68 students
26) At a tennis tournament a statistician keeps track of every serve. The statistician reported that the mean serve speed of a particular player was 97 miles per hour (mph) and the standard deviation of the serve speeds was 14 mph. Assume that the statistician also gave us the information that the distribution of the serve speeds was bell shaped. What proportion of the player’s serves are expected to be between 111 mph and 139 mph?
   A) 0.317  B) 0.68  C) 0.997  D) 0.1585

27) Describe the shape of the histogram. The data set: round-trip commuting times (in minutes) of 20 randomly selected employees
   135  120  115  132  136  124  119  145  98  110
   125  120  115  130  140  105  116  121  125  108
   A) symmetric  B) skewed to the right  C) skewed to the left  D) uniform

28) A severe drought affected several western states for 3 years. A Christmas tree farmer is worried about the drought’s effect on the size of his trees. To decide whether the growth of the trees has been retarded, the farmer decides to take a sample of the heights of 25 trees. Typically trees of this age have a mean height of 65 inches with a standard deviation of 9 inches. Assuming the distribution is bell shaped, where do you expect middle 95% of the tree heights to fall?
   A) between 56 and 74 inches tall  B) over 56 inches tall  C) between 38 and 92 inches tall  D) between 47 and 83 inches tall

29) The scores from a state standardized test have a mean of 80 and a standard deviation of 10. The distribution of the scores is roughly bell shaped. Use the Empirical Rule to find the percentage of scores that lie between 60 and 80.
   A) 47.5%  B) 68%  C) 34%  D) 95%

Describe the shape of the distribution.

30)

31)
Find the sample standard deviation.
32) 8, 9, 10, 11, 12
   A) 1.6          B) 1.5   C) 1.3   D) 2.5

Provide an appropriate response. Round relative frequencies to thousandths.
33) The preschool children at Elmwood Elementary School were asked to name their favorite color. The results are listed below. Construct a frequency distribution and a relative frequency distribution.
   red   red   green   purple   blue
   blue  blue  red    blue  green
   blue  green  purple  purple  purple
   green  blue  purple  blue  yellow

34) The results of a survey about a recent judicial appointment are given in the table below. Construct a relative frequency distribution.
<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Favor</td>
<td>40</td>
</tr>
<tr>
<td>Favor</td>
<td>18</td>
</tr>
<tr>
<td>Neutral</td>
<td>17</td>
</tr>
<tr>
<td>Oppose</td>
<td>21</td>
</tr>
<tr>
<td>Strongly Oppose</td>
<td>104</td>
</tr>
</tbody>
</table>

35) True or False: Relative frequency is the proportion (or percent) of observations within a category and is found using the formula: relative frequency = \( \frac{\text{sum of all frequencies}}{\text{frequency}} \).
   A) False       B) True
The bar graph shows the number of tickets sold each week by the garden club for their annual flower show.

36) During which week was the most number of tickets sold?
   A) week 2  
   B) week 4  
   C) week 5  
   D) week 1  

37) During which week was the fewest number of tickets sold?
   A) week 5  
   B) week 4  
   C) week 6  
   D) week 2  

38) How many tickets were sold during week 5?
   A) 46 tickets  
   B) 11 tickets  
   C) 40 tickets  
   D) 19 tickets  

Construct the requested frequency distributions.

39) The commute time (in minutes) of 30 executives 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
Construct a frequency distribution for the data.

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

12  20  14  17  14  12  14  13  11  17
15  13  13  12  15  14  11  11  16  13
11  13  20  15  12  16  12  15  14  13

Construct a frequency distribution for the data.

Explain what is misleading about the graphic.

41)

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

42)

A) The graphic is not misleading.
B) The horizontal scale does not begin at zero.
C) The graphic only includes information for one year.
D) The graphic may give the impression that drivers over age 65 had no DUI’s in 2001.

Construct a dot plot for the data.

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

70  72  71  70  69  73  69  68  70  71
67  71  70  74  69  68  71  71  71  72
69  71  68  67  73  74  70  71  69  68
Construct a stem-and-leaf plot for the data.

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

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

Compute the range for the set of data.

45) 11, 12, 13, 14, 15

A) 4  B) 0.8  C) 11  D) 15

45) _____