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

Solve the problem. If necessary, round your answer to one more decimal place than that used for the observations.

1) A scientist used the following data set showing the weight in pounds gained (or lost) by a sample of eight laboratory animals given Drug X. Determine \( n \), \( \sum x_i \), and \( \bar{x} \).

\[
\begin{array}{cccc}
8.8 & -7.8 & 2.0 & 3.0 \\
-2.3 & 2.8 & 5.5 & -5.6 \\
\end{array}
\]

A) \( n = 8; \quad \sum x_i = 6.4; \quad \bar{x} = 1.07 \)  
B) \( n = 8; \quad \sum x_i = 6.4; \quad \bar{x} = 0.8 \)  
C) \( n = 6; \quad \sum x_i = 6.4; \quad \bar{x} = 0.8 \)  
D) \( n = 6; \quad \sum x_i = 6.4; \quad \bar{x} = 1.07 \)

Answer: B

Objective: (3.1) Perform Sample Mean Calculation

Find the mean for the given sample data. Unless otherwise specified, round your answer to one more decimal place than that used for the observations.

2) The local Tupperware dealers earned these commissions last month:

$3588.80 
$4600.43 
$3054.05 
$1756.93 
$3616.34 
$4042.77 
$1347.38 
$4423.17 
$4896.32 
$4041.17

What was the mean commission earned? Round your answer to the nearest cent.

A) $3530.74  
B) $4420.92  
C) $3929.71  
D) $3536.74

Answer: D

Objective: (3.1) Find Mean

Find the median for the given sample data.

3) The normal monthly precipitation (in inches) for August is listed for 20 different U.S. cities.

\[
\begin{array}{cccccc}
3.5 & 1.6 & 2.4 & 3.7 & 4.1 \\
3.9 & 1.0 & 3.6 & 4.2 & 3.4 \\
3.7 & 2.2 & 1.5 & 4.2 & 3.4 \\
2.7 & 0.4 & 3.7 & 2.0 & 3.6 \\
\end{array}
\]

A) 3.40 in.  
B) 3.50 in.  
C) 3.45 in.  
D) 2.94 in.

Answer: C

Objective: (3.1) Find Median
Provide an appropriate response.

4) The amount of money, in dollars, that an employee of a bank spent on lunch on six randomly selected days yielded the following data set:

9, 14, 5, 16, 10, 8

Compute \( (\sum x_i)^2 \) and \( \sum x_i^2 \). Explain the difference between the two quantities.

A) \( 722 \) and \( 3844 \); \( (\sum x_i)^2 \) is the sum of the squares of the data, whereas \( \sum x_i^2 \) represents the square of the sum of the data.

B) \( 3844 \) and \( 722 \); \( (\sum x_i)^2 \) is the square of the sum of the data, whereas \( \sum x_i^2 \) represents the sum of the squares of the data.

C) \( 3721 \) and \( 62 \); \( (\sum x_i)^2 \) is the square of the sum of the data, whereas \( \sum x_i^2 \) represents the sum of the squares of the data.

D) \( 62 \) and \( 3844 \); \( (\sum x_i)^2 \) is the sum of the squares of the data, whereas \( \sum x_i^2 \) represents the square of the sum of the data.

Answer: B

Objective: (3.1) *Know Concepts: Measures of Center

Find the mean for the given sample data. Unless otherwise specified, round your answer to one more decimal place than that used for the observations.

5) Frank’s Furniture employees earned $254.59, $423.85, $381.75, $319.99, $199.95, and $394.91 last week. Find the mean wage of the employees. Round your answer to the nearest cent.

A) $493.76
B) $383.01
C) $395.01
D) $329.17

Answer: D

Objective: (3.1) Find Mean

Find the range and standard deviation for each of the two samples, then compare the two sets of results.

6) When investigating times required for drive-through service, the following results (in seconds) were obtained.

<table>
<thead>
<tr>
<th>Restaurant A</th>
<th>120</th>
<th>67</th>
<th>89</th>
<th>97</th>
<th>124</th>
<th>68</th>
<th>72</th>
<th>96</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restaurant B</td>
<td>115</td>
<td>126</td>
<td>49</td>
<td>56</td>
<td>98</td>
<td>76</td>
<td>78</td>
<td>95</td>
</tr>
</tbody>
</table>

A) Restaurant A: 75; 22.2
   Restaurant B: 70; 27.0
   It is inconclusive as to which data set has more variation.

B) Restaurant A: 57; 22.2
   Restaurant B: 56; 32.9
   It is inconclusive as to which data set has more variation.

C) Restaurant A: 57; 22.2
   Restaurant B: 77; 27.0
   Both measures indicate there is more variation in the data for restaurant B than the data for restaurant A.

D) Restaurant A: 57; 25.0
   Restaurant B: 70; 27.0
   Both measures indicate there is more variation in the data for restaurant B than the data for restaurant A.

Answer: C

Objective: (3.2) Compare Range and Standard Deviation for Two Samples
Provide an appropriate response.

7) The test scores of 40 students are summarized in the frequency distribution below. Find the standard deviation.

<table>
<thead>
<tr>
<th>Score</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 ≤ 60</td>
<td>8</td>
</tr>
<tr>
<td>60 ≤ 70</td>
<td>8</td>
</tr>
<tr>
<td>70 ≤ 80</td>
<td>6</td>
</tr>
<tr>
<td>80 ≤ 90</td>
<td>6</td>
</tr>
<tr>
<td>90 ≤ 100</td>
<td>12</td>
</tr>
</tbody>
</table>

A) \( s = 14 \)  \quad B) \( s = 15.5 \)  \quad C) \( s = 16.3 \)  \quad D) \( s = 14.7 \)

Answer: B

Objective: (3.2) Find Sample Deviation (Grouped Data)

Find the range for the given data.

8) The owner of a small manufacturing plant employs six people. As part of their personnel file, she asked each one to record to the nearest one-tenth of a mile the distance they travel one way from home to work. The six distances are listed below.

2.5 5.2 1.5 4.4 6.4 3.5

A) 1.5 mi  \quad B) 1 mi  \quad C) 5.2 mi  \quad D) 4.9 mi

Answer: D

Objective: (3.2) Find Range

9) Jeanne is currently taking college economics. The instructor often gives quizzes. On the past five quizzes, Jeanne got the following scores.

8 20 3 13 9

A) 1  \quad B) 20  \quad C) 3  \quad D) 17

Answer: D

Objective: (3.2) Find Range

Provide an appropriate response.

10) The heights of a group of professional basketball players are summarized in the frequency distribution below. Find the standard deviation. Round your answer to one decimal place.

<table>
<thead>
<tr>
<th>Height (in.)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>70 ≤ 72</td>
<td>3</td>
</tr>
<tr>
<td>72 ≤ 74</td>
<td>7</td>
</tr>
<tr>
<td>74 ≤ 76</td>
<td>16</td>
</tr>
<tr>
<td>76 ≤ 78</td>
<td>12</td>
</tr>
<tr>
<td>78 ≤ 80</td>
<td>10</td>
</tr>
<tr>
<td>80 ≤ 82</td>
<td>4</td>
</tr>
<tr>
<td>82 ≤ 84</td>
<td>1</td>
</tr>
</tbody>
</table>

A) 2.8  \quad B) 2.9  \quad C) 3.3  \quad D) 3.2

Answer: A

Objective: (3.2) Find Sample Deviation (Grouped Data)
Obtain the five-number summary for the given data.

11) The weights (in pounds) of 18 randomly selected adults are given below.

   120  146  187  156  119  138
   127  143  179  164  182  202
   114  173  131  150  169  173

   A) 114, 129.00, 150, 171.0, 202 pounds  B) 114, 130.00, 150, 174.50, 202 pounds
   C) 114, 131, 153.0, 173, 202 pounds  D) 114, 129.00, 231.5, 171.0, 202 pounds

   Answer: C
   Objective: (3.3) Obtain Five-Number Summary

Determine the quartile or interquartile range as specified.

12) The normal annual precipitation (in inches) is given below for 21 different U.S. cities. Find the third quartile, \( Q_3 \):

   19.1  34.9  10.2  37.9  22.4  9.1  12.6
   33.0  20.6  36.9  29.1  39.2  17.3  24.8
   31.9  13.6  28.8  15.0  22.3  25.8  11.7

   A) 31.200 in.  B) 31.9 in.  C) 24.8 in.  D) 32.45 in.

   Answer: B
   Objective: (3.3) Find Quartile/Interquartile Range

Construct and interpret a boxplot or a modified boxplot as specified.

13) The weekly salaries (in dollars) of 24 randomly selected employees of a company are shown below. Construct a boxplot for the data.

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

   A)
   B)

   The data is highly right-skewed.

   C)
   D)

   The data is fairly symmetrical.

   Answer: B
   Objective: (3.3) Construct and Interpret Boxplot or Modified Boxplot
14) The normal monthly precipitation (in inches) for August is listed for 20 different U.S. cities. Construct a boxplot for the data.

```
0.4  1.0  1.5  1.6  2.0 
2.2  2.4  2.7  3.4  3.4 
3.5  3.6  3.6  3.7  3.7 
3.9  4.1  4.2  4.2  7.0 
```

A) 

The data is slightly left-skewed.

B) 

The data is symmetrical. It is a uniform distribution.

C) 

The data is slightly left-skewed.

D) 

The data is highly left-skewed.

Answer: A

Objective: (3.3) Construct and Interpret Boxplot or Modified Boxplot

Obtain the five-number summary for the given data.

15) The test scores of 15 students are listed below.

```
40  47  50  53  57 
63  67  71  72  76 
85  87  90  94  95 
```

A) 40, 52.25, 71, 85.5, 95 
B) 40, 53, 71.5, 87, 95 
C) 40, 52.25, 71.5, 85.5, 95 
D) 40, 55, 71, 86, 95 

Answer: D

Objective: (3.3) Obtain Five-Number Summary
Provide an appropriate response.

16) Find the z-score corresponding to the given value and use the z-score to determine whether the value is unusual. Consider a score to be unusual if it is at least three standard deviations above or below the mean. Round the z-score to one decimal place, if necessary.

A time for the 100 meter sprint of 15.0 seconds at a school where the mean time for the 100 meter sprint is 17.5 seconds and the standard deviation is 2.1 seconds.

A) 1.2; not unusual  B) −2.5; unusual  C) −1.2; unusual  D) −1.2; not unusual

Answer: D

Objective: (3.4) Compare Relative Standing

Solve the problem.

17) The mean of a set of data is 325.14 and its standard deviation is 64.32. Find the z-score for a value of 379.70. Round your final answer to two decimal places.

A) 0.85  B) 1.15  C) 0.93  D) 0.76

Answer: A

Objective: (3.4) Find Standardized Variable

Provide an appropriate response.

18) Obtain the population standard deviation, σ, for the given data. Assume that the data represent population data. Round your final answer to one more decimal place than that used for the observations.

The weekly salaries (in dollars) of seven government workers are listed below

489  833  846  858  918  841  832

A) $17,124.2  B) $130.9  C) $1142.3  D) $141.4

Answer: B

Objective: (3.4) Find Population Standard Deviation

19) Obtain the population standard deviation, σ, for the given data. Assume that the data represent population data. Round your final answer to one more decimal place than that used for the observations.

The number of years of teaching experience is given below for 12 high-school teachers.

18  7  28  5  12  19
17  8  5  13  22  31

A) 9.8 yr  B) 68.9 yr  C) 8.3 yr  D) 8.7 yr

Answer: C

Objective: (3.4) Find Population Standard Deviation
20) Find the $z$-score corresponding to the given value and use the $z$-score to determine whether the value is unusual. Consider a score to be unusual if it is at least three standard deviations above or below the mean. Round to the $z$-score to two decimal places, if necessary.

A department store, on average, has daily sales of $28,264.66. The standard deviation of sales is $2000. On Tuesday, the store sold $35,625.01 worth of goods.

A) 3.86, not unusual   B) 2.94, not unusual
C) 3.68, unusual       D) 3.99, unusual

Answer: C

Objective: (3.4) Compare Relative Standing