Find the mean of the data summarized in the given frequency distribution.
1) A company had 80 employees whose salaries are summarized in the frequency distribution below. Find the mean salary.

<table>
<thead>
<tr>
<th>Salary ($)</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,001-10,000</td>
<td>17</td>
</tr>
<tr>
<td>10,001-15,000</td>
<td>20</td>
</tr>
<tr>
<td>15,001-20,000</td>
<td>12</td>
</tr>
<tr>
<td>20,001-25,000</td>
<td>14</td>
</tr>
<tr>
<td>25,001-30,000</td>
<td>17</td>
</tr>
</tbody>
</table>

A) $18,837.50  
B) $17,500  
C) $17,125.00  
D) $15,412.50
Answer: C

Solve the problem.
2) Michael gets test grades of 73, 77, 82, and 86. He gets a 93 on her final exam. Find the weighted mean if the tests each count for 15% and the final exam counts for 40% of the final grade. Round to one decimal place.

A) 82.2  
B) 243.9  
C) 84.9  
D) -74.1
Answer: C

Find the mean for the given sample data. Unless indicated otherwise, round your answer to one more decimal place than is present in the original data values.
3) Last year, nine employees of an electronics company retired. Their ages at retirement are listed below. Find the mean retirement age.

51 61 62  
54 68 58  
60 57 54  

A) 58.0 yr  
B) 57.1 yr  
C) 57.7 yr  
D) 58.3 yr
Answer: D

Find the median for the given sample data.
4) The temperatures (in degrees Fahrenheit) in 7 different cities on New Year’s Day are listed below.

26 29 33 59 67 68 78

Find the median temperature.

A) 33°F  
B) 59°F  
C) 51°F  
D) 67°F
Answer: B

Find the mode(s) for the given sample data.
5) 92 56 32 56 29 92

A) 92  
B) 59.5  
C) 92, 56  
D) 56
Answer: C

Find the midrange for the given sample data.
6) 3 6 9 0 4 1 11 5 9 14 3 8 2 15 0 9

A) 5.5  
B) 8  
C) 15  
D) 7.5
Answer: D
Find the mean and median for each of the two samples, then compare the two sets of results.

7) A comparison is made between summer electric bills of those who have central air and those who have window units.

<table>
<thead>
<tr>
<th></th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>$32</td>
<td>$64</td>
<td>$80</td>
<td>$90</td>
<td>$65</td>
</tr>
<tr>
<td>Window</td>
<td>$15</td>
<td>$84</td>
<td>$99</td>
<td>$120</td>
<td>$40</td>
</tr>
</tbody>
</table>

Answer: Central air: mean = $66.20; median = $65

Window unit: mean = $71.60; median = $84

Window units appear to be significantly more expensive.

Find the variance for the given data. Round your answer to one more decimal place than the original data.

8) 18 20 18 2 7

A) 51.2  B) 63.9  C) 64.0  D) 99.2

Answer: C

Find the standard deviation for the given sample data. Round your answer to one more decimal place than is present in the original data.

9) 114 105 245 193 295 248 229 229 170

A) 25.4  B) 63.6  C) 67.9  D) 59.9

Answer: B

Find the coefficient of variation for each of the two sets of data, then compare the variation. Round results to one decimal place.

10) Listed below are the systolic blood pressures (in mm Hg) for a sample of men aged 20-29 and for a sample of men aged 60-69.

   Men aged 20-29: 116 125 132 118 131 123
   Men aged 60-69: 128 151 140 125 164 139

A) Men aged 20-29: 5.5%
   Men aged 60-69: 10.7%
   There is substantially more variation in blood pressures of the men aged 60-69.

B) Men aged 20-29: 8.7%
   Men aged 60-69: 4.7%
   There is more variation in blood pressures of the men aged 20-29.

C) Men aged 20-29: 5.0%
   Men aged 60-69: 8.4%
   There is substantially more variation in blood pressures of the men aged 60-69.

D) Men aged 20-29: 5.3%
   Men aged 60-69: 10.3%
   There is substantially more variation in blood pressures of the men aged 60-69.

Answer: D

Find the standard deviation of the data summarized in the given frequency distribution.

11) 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>50-59</td>
<td>5</td>
</tr>
<tr>
<td>60-69</td>
<td>13</td>
</tr>
<tr>
<td>70-79</td>
<td>5</td>
</tr>
<tr>
<td>80-89</td>
<td>8</td>
</tr>
<tr>
<td>90-99</td>
<td>9</td>
</tr>
</tbody>
</table>

A) 14.7  B) 13.3  C) 14  D) 12.6

Answer: C
Use the range rule of thumb to estimate the standard deviation. Round results to the nearest tenth.

12) The race speeds for the top eight cars in a 200-mile race are listed below.

   185.9  179.5  189.2  176.7  175.6  188.7  186.3  177.9
A) 1.1   B) 3.4   C) 6.8   D) 7.5

Answer: B

Use the empirical rule to solve the problem.

13) At one college, GPA's are normally distributed with a mean of 2.9 and a standard deviation of 0.6. What percentage of students at the college have a GPA between 2.3 and 3.5?

A) 84.13%   B) 95%   C) 99.7%   D) 68%

Answer: D

Solve the problem.

14) The heights of the adults in one town have a mean of 67.5 inches and a standard deviation of 3.4 inches. What can you conclude from Chebyshev's theorem about the percentage of adults in the town whose heights are between 57.3 and 77.7 inches?

A) The percentage is at least 99.7%   B) The percentage is at most 88.9%
C) The percentage is at most 99.7%   D) The percentage is at least 88.9%

Answer: D

Solve the problem. Round results to the nearest hundredth.

15) Scores on a test have a mean of 70 and a standard deviation of 11. Michelle has a score of 48. Convert Michelle’s score to a z-score.

A) -2   B) 2   C) 22   D) -22

Answer: A

16) A department store, on average, has daily sales of $29,876.76. The standard deviation of sales is $1000. On Tuesday, the store sold $34,893.71 worth of goods. Find Tuesday’s z score. Was Tuesday an unusually good day?

A) 5.33, yes   B) 4.01, no   C) 5.02, yes   D) 5.27, no

Answer: C

Find the number of standard deviations from the mean. Round your answer to two decimal places.

17) The annual snowfall in a town has a mean of 38 inches and a standard deviation of 10 inches. Last year there were 63 inches of snow. How many standard deviations from the mean is that?

A) 0.44 standard deviations above the mean   B) 2.50 standard deviations above the mean
C) 0.44 standard deviations below the mean   D) 2.50 standard deviations below the mean

Answer: B

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 its z-score is less than -2.00 or greater than 2.00. Round the z-score to the nearest tenth if necessary.

18) A body temperature of 99.5°F given that human body temperatures have a mean of 98.20°F and a standard deviation of 0.62°F.

A) 2.1; not unusual   B) 2.1; unusual   C) -2.1; unusual   D) 1.3; not unusual

Answer: B

19) A weight of 110 pounds among a population having a mean weight of 164 pounds and a standard deviation of 25.6 pounds.

A) -2.1; unusual   B) 2.1; not unusual   C) -53.8; unusual   D) -2.1; not unusual

Answer: A
Determine which score corresponds to the higher relative position.

20) Which is better, a score of 92 on a test with a mean of 71 and a standard deviation of 15, or a score of 688 on a test with a mean of 493 and a standard deviation of 150?
   A) A score of 688
   B) Both scores have the same relative position.
   C) A score of 92

Answer: C

Find the percentile for the data value.

21) Data set: 4 13 8 6 4 13 6 4 13 2 13 15 5 9 4 12 8 6 13;
    data value: 6
    A) 62
    B) 25
    C) 40
    D) 35

Answer: D

Find the indicated measure.

22) The test scores of 32 students are listed below. Find \( P_{46} \).

32 37 41 44 46 48 53 55
56 57 59 63 65 66 68 69
70 71 74 74 75 77 78 79
80 82 83 86 89 92 95 99

A) 15
B) 14.72
C) 67
D) 68

Answer: D

23) The weights (in pounds) of 30 newborn babies are listed below. Find \( P_{16} \).

5.5 5.7 5.8 5.9 6.1 6.1 6.4 6.4 6.5 6.6
6.7 6.7 6.7 6.9 7.0 7.0 7.1 7.2 7.2
7.4 7.5 7.7 7.7 7.8 8.0 8.1 8.1 8.3 8.7

A) 6.1 lb
B) 6.0 lb
C) 4.8 lb
D) 5.9 lb

Answer: A

Construct a boxplot for the given data. Include values of the 5-number summary in all boxplots.

24) The weights (in pounds) of 30 newborn babies are listed below. Construct a boxplot for the data set.

5.5 5.7 5.8 5.9 6.1 6.1 6.3 6.4 6.5 6.6
6.7 6.7 6.7 6.9 7.0 7.0 7.1 7.2 7.2
7.4 7.5 7.7 7.7 7.8 8.0 8.1 8.1 8.3 8.7

A) 

B) 

C) 

D) 

Answer: B
Provide an appropriate response.

25) For data which are heavily skewed to the right, $P_{10}$ is likely to be closer to the median than $P_{90}$. True or false?
   A) False
   B) True
   Answer: B

26) If all the values in a data set are converted to z-scores, the shape of the distribution of the z-scores will be the same as the distribution of the original data. True or false?
   A) True
   B) False
   Answer: A

Construct a modified boxplot for the data. Identify any outliers.

27) The weights (in ounces) of 27 tomatoes are listed below.
   1.7  2.0  2.2  2.2  2.4  2.5  2.5  2.5  2.6  
   2.6  2.6  2.7  2.7  2.7  2.8  2.8  2.8  2.9  
   2.9  2.9  3.0  3.0  3.1  3.1  3.3  3.6  4.2
   A) No outliers
   B) Outlier: 4.2 oz
   C) Outliers: 1.7 oz, 3.6 oz, 4.2 oz
   D) Outliers: 1.7 oz, 4.2 oz
   Answer: D

Construct a scatterplot for the given data.
28) \[
\begin{array}{c|c|c|c|c|c|c|c}
   x  & 0.75 & 0.68 & 0.12 & 0.24 & 0.25 & 0.28 & 0.59 & 0.37 \\
   y  & 0.15 & 0.09 & -0.07 & 0.46 & 0.49 & 0.41 & 0.88 & -0.38 \\
\end{array}
\]

Answer: A

Find the value of the linear correlation coefficient r.

29) \[
\begin{array}{c|c|c|c|c|c|c|c}
   x  & 23.6 & 35.3 & 18.3 & 49.0 & 13.2 \\
   y  & 4    & 9    & 3    & 3    & 8    \\
\end{array}
\]

A) -0.2  B) 0  C) 0.2  D) -0.178

Answer: A
Use the given data to find the equation of the regression line. Round the final values to three significant digits, if necessary.

<table>
<thead>
<tr>
<th>x</th>
<th>2</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>7</td>
<td>11</td>
<td>13</td>
<td>20</td>
</tr>
</tbody>
</table>

A) $\hat{y} = 0.15 + 3.0x$  
B) $\hat{y} = 2.8x$  
C) $\hat{y} = 0.15 + 2.8x$  
D) $\hat{y} = 3.0x$

Answer: D

<table>
<thead>
<tr>
<th>x</th>
<th>0</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>8</td>
<td>2</td>
<td>6</td>
<td>9</td>
<td>12</td>
</tr>
</tbody>
</table>

A) $\hat{y} = 4.98 + 0.725x$  
B) $\hat{y} = 4.88 + 0.525x$  
C) $\hat{y} = 4.98 + 0.425x$  
D) $\hat{y} = 4.88 + 0.625x$

Answer: B