1. Find the volume of a cube measuring 3.5 ft on a side.
   A. 10.5 ft$^3$  B. 15.875 ft$^3$
   C. 24.5 ft$^3$  D. 42.875 ft$^3$

2. Ms. Kim’s new computer monitor came in a box, which measured $2\frac{3}{4}$ feet by 3 feet by 2 feet. What is the volume of the box?
   A. $8\frac{3}{4}$ ft$^3$  B. $12\frac{1}{2}$ ft$^3$
   C. $16\frac{1}{2}$ ft$^3$  D. $20\frac{1}{4}$ ft$^3$

3. The rectangular solid shown will have what volume?
   A. 5253.576 cm$^3$  B. 5273.875 cm$^3$
   C. 5353.786 cm$^3$  D. 6356.567 cm$^3$

4. Find the volume of the cube shown.
   A. $512\frac{1}{2}$ in$^3$  B. $614\frac{1}{8}$ in$^3$
   C. $614\frac{1}{2}$ in$^3$  D. $128\frac{1}{8}$ in$^3$

5. The figure shows three points on a coordinate plane. Suppose you wanted to add a fourth point to form a parallelogram. Which of these ordered pairs could be fourth point?
   A. (3, 5)  B. (5, 3)  C. (2, 6)  D. (6, 1)
6. What is the name of the 3-dimensional figure that can be formed by this net?
   A. A cube
   B. A triangular prism
   C. A square pyramid
   D. A triangular pyramid

7. What polyhedron will be formed by folding this pattern?
   A. cube
   B. cone
   C. triangular prism
   D. rectangular prism

8. Which net, when folded, will form a triangular prism?
   A. 
   B. 
   C. 
   D. 

9. The sketch represents a rectangular barn with an A-frame roof. Which diagram best represents the top view of the barn?
   A. 
   B. 
   C. 
   D.
10. Which of the following is a net of the square pyramid?

A. 

B. 

C. 

D. 

11. Which solid figure would result from folding up the figure shown here?

A. 

B. 

C. 

D. 
12. Which is a statistical question?

A. How much money does a 28 year old need to save each week to have $1,000,000 by the age of 45?
B. What is average starting salary of a chemical engineer in the United States?
C. How many 28 year olds deposit money into a savings account each week?
D. What was the amount that Kate spent on rent last month?

13. How could you show more studying improves grades?

A. Take a survey in your class to find out how much students study.
B. Take a survey of students grades.
C. Survey only those who failed math and english.
D. Collect data regarding study time and grade.

14. One university recruits highly motivated students by publishing the job placement record for graduates of the school.

Which of these is a reliable data collection method?

A. Follow-up study of 2500 graduates from a number of departments
B. Follow-up study of 10 graduates with Art History degrees
C. Follow-up study of a graduate who was also a championship NCAA basketball player
D. Follow-up study of 100 graduates with Computer Science degrees

15. The following data are test scores for a class of 20 students:
98, 96, 83, 91, 88, 77, 58, 75, 62, 80, 100, 87, 93, 91, 64, 91, 85, 90, 76, 92

a) Complete the table.

<table>
<thead>
<tr>
<th>Interval</th>
<th>Number (frequency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>91–100</td>
<td></td>
</tr>
<tr>
<td>81–90</td>
<td></td>
</tr>
<tr>
<td>71–80</td>
<td></td>
</tr>
<tr>
<td>61–70</td>
<td></td>
</tr>
<tr>
<td>51–60</td>
<td></td>
</tr>
</tbody>
</table>

b) In which interval does the mode lie?

c) In which interval does the median lie?
Jennifer belongs to a community theatre group. She collected information about performer ages in a frequency table and displayed the data in a histogram.

Mrs. Hathaway is a 32-year-old who wants to join the group. She can reasonably conclude that she is—

A. twice as old as the average performer.
   - exactly the median age.

B. older than the average performer.
   - younger than the median age.

C. older than the average performer.
   - older than the median age.

D. younger than the average performer.
   - exactly the median age.
17. Use the data below to answer the following question(s).

Nuncio manages a local restaurant. He collected information about the worker round-trip commute times in a frequency table and displayed the data in a histogram.

<table>
<thead>
<tr>
<th>Round-Trip Commute Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td>26</td>
</tr>
</tbody>
</table>

Which of these describes the data?

A. Exactly 50% of the workers have a round-trip commute of 20 minutes or less.

B. More than 25% of the workers have a round-trip commute over 50 minutes.

C. One-fourth of the workers have 41–50 minute round-trip commutes.

D. There are 4 workers who have a 20 minute round-trip commute.
18. Mark made a line plot of his most recent bowling scores.

\[
\begin{array}{cccccc}
X & X \\
X & X \\
X & X & X & X & X \\
\end{array}
\]

Bowling Scores

Mark predicts that over the next 3 games, his average score will be 123.

Is the prediction reasonable?

A. Yes, because the mean of his recent scores is 123.
B. No, because the mean of his recent scores is 130.
C. No, because the median of his recent scores is 125.
D. Yes, because the range of his recent scores is 110 to 150.

19. Answer \textit{always, sometimes or never} true:

The mean of a set of numbers can be smaller than the smallest number of the set.

20. Answer \textit{always, sometimes or never} true:

The mean of a set of numbers must be one of the numbers of the set.

21. Corey, a player on the Panthers basketball team has scored the following points over the past nine games: 56, 18, 1, 11, 7, 7, 14, 14 and 7.

First find the mean number of points per game. Second find the range of the data.

What are the two reasons why we should consider the range as well as the mean when describing this data?

I. The mean is unusually high compared to most of the data values.
II. The mean is unusually low compared to most of the data values.
III. The range tells us the total number of points Corey has scored in the past nine games.
IV. The range gives a better indication of Corey’s consistency.

A. I and II only \quad B. II and IV only

C. III and IV only \quad D. I and IV only
22. Hanna recorded the voltage drop across some resistors in her circuit, as shown in the table. What is the range and median of her data?

<table>
<thead>
<tr>
<th>Resistor</th>
<th>Voltage Drop (milliamps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.4</td>
</tr>
<tr>
<td>2</td>
<td>7.2</td>
</tr>
<tr>
<td>3</td>
<td>5.3</td>
</tr>
<tr>
<td>4</td>
<td>6.2</td>
</tr>
<tr>
<td>5</td>
<td>4.8</td>
</tr>
<tr>
<td>6</td>
<td>7.5</td>
</tr>
</tbody>
</table>

A. Median: 6.7 mA
   Range: 0.9 mA

B. Median: 7.2 mA
   Range: 4.4 mA

C. Median: 6.2 mA
   Range: 3.5 mA

D. Median: 6.7 mA
   Range: 3.6 mA

23. Ms. Smith eliminates the lowest score from every student's grade each grading cycle. How does this affect the mean and median for each student?

A. It will have no effect on either the mean or the median.

B. It will probably affect the median more than the mean.

C. It will affect the mean and the median equally.

D. It will probably affect the mean more than the median.

24. The box given shows Tang’s scores on five history papers.

100, 88, 83, 79, 95

What is the relationship between Tang’s mean and median scores?

A. The mean is one point lower than the median.

B. The mean is one point higher than the median.

C. The mean is five points lower than the median.

D. The mean is five points higher than the median.
25. The following sets of data are given by the characteristics minimum, \( Q_1 \) or quartile one, median, \( Q_3 \) or quartile three, and maximum. For each set of data draw a box-plot.

<table>
<thead>
<tr>
<th>Part</th>
<th>smallest number</th>
<th>( Q_1 )</th>
<th>median</th>
<th>( Q_3 )</th>
<th>largest number</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>12</td>
<td>15</td>
<td>21</td>
<td>23</td>
<td>40</td>
</tr>
<tr>
<td>B</td>
<td>43</td>
<td>82</td>
<td>103</td>
<td>152</td>
<td>234</td>
</tr>
</tbody>
</table>

26. Students can purchase semester bus passes in the school office. Mrs. Solorio kept track of the number of bus passes sold during the first weeks of school.

<table>
<thead>
<tr>
<th>56</th>
<th>19</th>
<th>22</th>
<th>47</th>
<th>15</th>
<th>31</th>
<th>23</th>
<th>23</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>22</td>
<td>16</td>
<td>44</td>
<td>42</td>
<td>51</td>
<td>63</td>
<td>50</td>
</tr>
</tbody>
</table>

Construct a box-and-whisker plot for the data.

27. Use the data in the table to make a dot plot.

<table>
<thead>
<tr>
<th>Number of Vehicles in Household</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

28. Draw box plots for two sets of data that have the same minimum, same maximum, same median, but different interquartile range.

A. 

B. 

C. 

D. 
29. The following table gives the number of days that the students of Mr. Super’s class are absent in the year.

<table>
<thead>
<tr>
<th>Days Absent</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
</tr>
</tbody>
</table>

Which of the following is the correct boxplot for this data.

A. 3   5   7
    6   12

B. 3   5   8
    6   12

C. 3   5   9
    6   12

D. 3   5   7   9
    6   12

30. Which box-and-whisker plot represents the following information?

Test scores: 82, 64, 60, 78, 100, 98, 62, 90, 85, 67, 61, 95, 65

A. 60 70 80 90 100

B. 60 70 80 90 100

C. 60 70 80 90 100

D. 60 70 80 90 100

31. Which of the following sets of data is represented on the box-and-whiskers plot?

A. 8, 11, 12, 12, 12, 12, 15, 16, 17, 18, 24
B. 8, 12, 13, 15, 16, 17, 19, 20, 20, 21, 24
C. 8, 11, 12, 12, 15, 16, 17, 20, 21, 22, 24
D. 8, 10, 12, 12, 13, 15, 16, 16, 16, 18, 24
32. The 24 cars surveyed had the following smog check ratings:

32, 48, 55, 62, 65, 66, 67, 71, 71, 73, 76, 76, 77, 79, 85, 86, 86, 87, 87, 90, 93, 100, 100

Which histogram depicts the same data?
33. Renu was answering a question in her math assignment where she had to understand how the intervals of a frequency table changes the corresponding widths and heights of the bars in a histogram.

<table>
<thead>
<tr>
<th>Rainfall (cm)</th>
<th>Tally</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0–0.5</td>
<td>HHH HHH HHH HHH HHH</td>
<td>24</td>
</tr>
<tr>
<td>0.6–1.1</td>
<td>HHH HHH HHH HHH</td>
<td>19</td>
</tr>
<tr>
<td>1.2–1.7</td>
<td>HHH HHH HHH</td>
<td>15</td>
</tr>
<tr>
<td>1.8–2.3</td>
<td>HHH</td>
<td>5</td>
</tr>
</tbody>
</table>

Renu has to correctly match the frequency table with a histogram to complete her assignment. Which histogram correctly matches with the frequency table?

A. ![Histogram A](image)

B. ![Histogram B](image)

C. ![Histogram C](image)

D. ![Histogram D](image)
34. The table below shows the daytime highs in Seattle for the past week.

<table>
<thead>
<tr>
<th>Day</th>
<th>S</th>
<th>M</th>
<th>T</th>
<th>W</th>
<th>T</th>
<th>F</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>High temp. (in °C)</td>
<td>12</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

Which graph shows the same information as the table?

A.  

![Graph A](image)

B.  

![Graph B](image)

C.  

![Graph C](image)

D.  

![Graph D](image)

35. The histogram shows responses from a survey of 32 students.

<table>
<thead>
<tr>
<th>Number of Hours</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

How many students studied less than 2 hours?

What percent of students studied for 3 hours?

What was the average number of hours studied by all students who were surveyed? Explain.

36. The graph shows the average water consumption during one week among the highest and lowest users of water.

![Graph E](image)

On which day did the smallest gap in water usage occur?

What was the greatest gap in water usage?
37. The box-and-whisker plot represents scores on the most recent test. What percentage of the students scored between 70 and 100?

A. 25%  
B. 50%  
C. 70%  
D. 75% 

38. The box-and-whisker plot represents scores on the most recent test. What percentage of the students scored between 70 and 90?

A. 25%  B. 50%  C. 70%  D. 75% 

39. The chart shows the number of trucks rented every business day (Monday through Saturday) for a truck rental company. What are the values for the two highest days?

A. 40 trucks and 70 trucks  
B. 42 trucks and 40 trucks  
C. 57 trucks and 48 trucks  
D. 70 trucks and 65 trucks 

40. In the tri-state gymnastics competition, judges will eliminate each gymnast’s lowest score when they compute scores at the end of the competition. How will the procedure affect the mean and median for an individual gymnast?

A. It will affect the mean and the median equally.  
B. It will have no effect on either the mean or the median.  
C. It will probably affect the mean more than the median.  
D. It will probably affect the median more than the mean.

41. The students in Mr. Lester’s class have a median height of 55 inches. Which of these interpretations is correct?

A. The students range in height from 50 to 60 inches.  
B. The mean height is 55 inches.  
C. Most of the students are 55 inches tall.  
D. Half of the students are 55 inches or taller.

42. The prices of some candy bars in cents are given below.

49, 49, 50, 50, 52, 52

Which measure of central tendency will you use to find how much a piece of candy bar costs on average for this collection of candy bars?

A. Mode: 49, 50, 52  B. Median: 50  
C. Mean: 50  D. Range: 3
43. Box-and-whisker plots are helpful in interpreting the distribution of data. Dr. Brown created one using the cost of prescription drugs regularly prescribed in his practice. What would happen to the box-and-whisker plot if a new drug came out that only cost $10?

A. The range would change dramatically.
B. The upper quartile would increase dramatically.
C. The lower quartile would stay the same.
D. There would be no change.

44. Four box-and-whisker plots are shown in the figure below. Which graph is from the data set with the smallest interquartile range?

A. 
B. 
C. 
D. 

45. A math test was given to Mr. Supers’ class. The table shows the time the students took to complete the test.

<table>
<thead>
<tr>
<th>Time (in minutes)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>10</td>
</tr>
<tr>
<td>36</td>
<td>7</td>
</tr>
<tr>
<td>34</td>
<td>1</td>
</tr>
<tr>
<td>32</td>
<td>3</td>
</tr>
<tr>
<td>30</td>
<td>6</td>
</tr>
</tbody>
</table>

Using the data table, determine the:

a) total number of students who took the test
b) mode
c) median
d) mean, to the nearest tenth
46. The Meyer family decided to buy a camping tent to use on their next vacation. They found four different tents on sale. The price tags read:

$ 69.99  
$ 89.99  
$159.99  
$199.99  

What was the average price of the four tents?

A. $119.99  
B. $115.99  
C. $129.99  
D. $135.99  

47. Simplify: 8 ÷ 2^6

A. \( \frac{1}{16} \)  
B. \( \frac{1}{4} \)  
C. \( \frac{1}{8} \)  
D. 2

48. \( 2^3 \times 3^2 \times 5 \) is the prime factorization for which number?

A. 900  
B. 180  
C. 360  
D. 2,700

49. \( 5 \times 3^2 \) is the prime factorization of what number?

A. 15  
B. 25  
C. 45  
D. 75

50. \( 2^2 + 3^2 = \)______

A. 12  
B. 13  
C. 24  
D. 36

51. Evaluate: \( \left( \frac{1}{2} \right)^6 \)

A. \( \frac{1}{64} \)  
B. \( \frac{1}{32} \)  
C. \( \frac{6}{64} \)  
D. \( \frac{6}{12} \)

52. Simplify: \( \left( \frac{2}{3} \right)^3 \)

A. \( \frac{8}{27} \)  
B. \( \frac{6}{9} \)  
C. \( \frac{8}{9} \)  
D. \( \frac{8}{3} \)

53. The square of \( \frac{3}{4} \) is _____.

A. \( \frac{3}{4} \)  
B. \( \frac{9}{12} \)  
C. \( \frac{9}{16} \)  
D. \( \frac{12}{16} \)

54. \( (1.1)^2 = \)_____

A. 1.21  
B. 0.0121  
C. 2.12  
D. 22
55. The value of $4.2^2$ is _____.
   A. 4.2   B. 17.64   C. 8.4   D. 1.764

56. Which of the following represents $4^3 \times 2^2$ in factored form?
   A. $12 \cdot 4$   B. $4 \cdot 4 \cdot 2 \cdot 2 \cdot 2$
   C. $4 \cdot 4 \cdot 4 \cdot 2 \cdot 2$   D. $4 \cdot 4 \cdot 4 \cdot 2 \cdot 2 \cdot 2$

57. Express $2 \times 2 \times 2 \times n \times n \times n \times n \times n \times n$ using exponents.
   A. $2n^6$   B. $4(2n)^4$
   C. $2^4n$   D. $2^4n^6$

58. What expression is equivalent to $3(x + 4)$?
   A. $3x + 4$   B. $x + 12$
   C. $3x + 12$   D. $x^3 + 12$

59. What expression is equivalent to $2(x + 8)$?
   A. $x + 16$   B. $2x + 8$
   C. $2x + 16$   D. $x^2 + 16$

60. Express $a \times a \times a \times a \times a \times a \times a$ in exponential notation.
   A. $a^8$   B. $7a$   C. $8^a$   D. $8 + a$

61. Simplify: $8(2 \cdot y)$
   A. $\frac{1}{2}y$   B. $10y$   C. $16y$   D. $32y$

62. Simplify: $5t + 8t$
   A. $40t^2$   B. $40t$   C. $13t^2$   D. $13t$

63. Simplify: $7w + 4w$
   A. $28w$   B. $11w^2$   C. $11w$   D. $28w^2$
64. Look at the following.

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>-4t</th>
<th>-4</th>
<th>-4k</th>
</tr>
</thead>
</table>

Which are like terms?

A. -4 and -4k  
B. -4, -4t and -4k  
C. t and -4t  
D. -4t and -4k