1. Place parentheses within the problem to create a true statement:  \(3 \cdot 18 - 3 + 6 + 4 \div 2 = 50\)
   A. \(3 \cdot (18 - 3) + (6 + 4) \div 2\)  
   B. \(3 \cdot 18 - (3 + 6) + 4 \div 2\)  
   C. \(3 \cdot (18 - 3) + (6 + 4) \div 2\)  
   D. \(3 \cdot 18 - 3 + (6 + 4) \div 2\)

2. Given the following ordered pairs, identify the range.
   \((-3, 4), (-\frac{8}{3}, 5), (2, 5), (-6, -7), (1.9, -8.1)\)
   A. \(-6, -3, -\frac{8}{3}, 1.9, 2\)  
   B. \(-8.1, -7, -\frac{5}{8}, 4, 5\)  
   C. All real numbers  
   D. \((-3, 4), (-\frac{8}{3}, 5), (2, 5), (-6, -7), (1.9, -8.1)\)

3. Determine which relation is a function.

   **Relation I**
   
<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>-2</td>
</tr>
<tr>
<td>5</td>
<td>-3</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>11</td>
</tr>
</tbody>
</table>

   **Relation II**
   
<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>2</td>
</tr>
<tr>
<td>-1</td>
<td>2</td>
</tr>
<tr>
<td>-1</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
</tr>
</tbody>
</table>

   **Relation III**
   
<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>4</td>
</tr>
<tr>
<td>0</td>
<td>-7</td>
</tr>
<tr>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>-3</td>
</tr>
</tbody>
</table>

   **Relation IV**
   
<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-3, 4)</td>
<td>(-0.5, 2)</td>
</tr>
<tr>
<td>(-1.25, 2.5)</td>
<td></td>
</tr>
<tr>
<td>(0.4, 5)</td>
<td>(2, -3)</td>
</tr>
</tbody>
</table>

   A. All of the relations are functions  
   B. Relation II and III  
   C. Relation I and IV  
   D. None of the relations are functions

4. On the day of the field trip, each teacher must call the parents of any student who has not returned a permission slip. All of Mr. Gomez’s students returned their permission slips, so he did not have to make any calls. Mrs. Hooper and Mr. Anderson had to call a total of eight parents. Mrs. Hooper needed to call two more students than Mr. Anderson. Which set of equations correctly describes the phone calls made? (Let \(H =\) Mrs. Hooper’s calls and \(A =\) Mr. Anderson’s calls.)

   A. \(H + A = 8; H = A + 2\)  
   B. \(H + A = 8; A = H + 2\)  
   C. \(H + A = 2; H = A + 8\)  
   D. \(H + A = 2; A = H + 8\)
Use the table below to answer questions 5 - 7:

### U.S. Population data from 1982 to 1988:

<table>
<thead>
<tr>
<th>Year</th>
<th>Population (thousands)</th>
<th>Change in Population (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982</td>
<td>231,664</td>
<td>---</td>
</tr>
<tr>
<td>1983</td>
<td>233,792</td>
<td>2,128</td>
</tr>
<tr>
<td>1984</td>
<td>235,825</td>
<td>2,033</td>
</tr>
<tr>
<td>1985</td>
<td>237,924</td>
<td>2,099</td>
</tr>
<tr>
<td>1986</td>
<td>240,133</td>
<td>2,209</td>
</tr>
<tr>
<td>1987</td>
<td>242,289</td>
<td>2,156</td>
</tr>
<tr>
<td>1988</td>
<td>244,499</td>
<td>2,210</td>
</tr>
</tbody>
</table>

http://www.census.gov/popest/archives/1990s/popclockest.txt

5. What type of function could model the above situation?
   A. Linear  
   B. Exponential  
   C. Quadratic  
   D. Cannot be determined

6. Mike decides to use a linear function to model the relationship. He chooses 2,139, the average of the values in the 3rd column, for the slope. What meaning does this value have in the context of this model?
   A. On average, the population increases 2,139 people each year.  
   B. On average, the population increases 2,139,000 people each year.  
   C. On average, the population increases 2.139 people each year.  
   D. The initial population increased by 2,139 people.

   A. 253,043 thousand people  
   B. 210,263 thousand people  
   C. 2,318,669 thousand people  
   D. 2,295,140 thousand people
Use the following information for questions 8 - 10:
Lauren keeps records of the distances she travels in a taxi and what she pays:

<table>
<thead>
<tr>
<th>Distance, $d$, in miles</th>
<th>Fare, $F$, in dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>8.25</td>
</tr>
<tr>
<td>5</td>
<td>12.75</td>
</tr>
<tr>
<td>11</td>
<td>26.25</td>
</tr>
</tbody>
</table>

8. What type of function could model the above situation?
   A. Linear
   B. Exponential
   C. Quadratic
   D. Cannot be determined

9. What is the y-intercept of the function above?
   A. 4.25
   B. 0
   C. 2.25
   D. 1.5

10. What does the slope represent in the above situation
    A. cost of the taxi ride
    B. cost per mile of the taxi ride
    C. the initial cost of the taxi ride
    D. number of miles traveled in taxi

11. Which of the following is the equation for graph C
    A. $f(x) = 2(x - 1)$
    B. $f(x) = 2(x + 1)$
    C. $f(x) = 2x$
    D. $f(x) = 2x + 1$
12. Which of the following shows the graph of \( f(x) = 2x + 4 \) and the inverse of \( f(x) \).  
Note: \( f(x) \) is represented as a solid line and \( f(x)^{-1} \) is represented as a dashed line.

A. 

B. 

C. 

D. 

13. What is the intersection of \( f(x) = 2x + 4 \) and its inverse?

A. they don’t intersect  
B. \((-8, -12)\)  
C. \((-4, -4)\)  
D. \((-2.4, -0.8)\)
14. The air and water temperatures at 3:00 PM at a popular summer swimming hole were recorded for a week. It is thought that the water temperature depends on the air temperature. Which is the correct scatter plot showing the dependence of water temperature on air temperature?

<table>
<thead>
<tr>
<th>$T_A$ (°F)</th>
<th>$T_W$ (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>72</td>
</tr>
<tr>
<td>94</td>
<td>74</td>
</tr>
<tr>
<td>88</td>
<td>70</td>
</tr>
<tr>
<td>89</td>
<td>71</td>
</tr>
<tr>
<td>95</td>
<td>73</td>
</tr>
<tr>
<td>98</td>
<td>75</td>
</tr>
<tr>
<td>92</td>
<td>71</td>
</tr>
</tbody>
</table>

A.  
B.  
C.  
D. 

15. Choose the graph that could have a possible correlation coefficient of $r = -0.10$?

A.  
B.  
C.  
D. 
16. Fill in the blank: Correlation does not ___________ causation.
   A. cause  B. imply  C. beat  D. run

17. Which of the following values for \( r \) suggests that one variable causes another?
   A. -0.7  B. 0  C. 0.9  D. None of the above

18. Given the following box plot, what are the lower quartile, median, and upper quartile?
   A. 11.5, 14, and 16  B. 12, 16, and 18  C. 12, 12.7, and 15  D. 11, 14, and 20

19. The interquartile range of a set of 18 data points will contain how many of the data points?
   A. 9  B. 4  C. 10  D. 12

20. Given the following histogram, how can we describe the shape of the data?
   A. skewed right  B. skewed left  C. symmetric  D. constant
21. The following table summarizes the hair color of a baseball team. What is the probability that a player has brown hair?

<table>
<thead>
<tr>
<th>Hair Color</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blonde</td>
<td>5</td>
</tr>
<tr>
<td>Brown</td>
<td>15</td>
</tr>
<tr>
<td>Black</td>
<td>10</td>
</tr>
<tr>
<td>Gray</td>
<td>1</td>
</tr>
</tbody>
</table>

A. 0.48  B. 0.16  C. 0.32  D. 0.03

22. Alexandra is trying to campaign for a $1 raise in her allowance. She has made up a PowerPoint to show her parents, and wants to make a bar graph of the allowances of the 35 kids in her homeroom. Their allowances range from $3 per week to $8.50 per week. Which unit would make sense for each box of the bar graph to represent?

A. $10  B. $1  C. $0.25  D. $0.01

23. Solve for \( v \): \( vu = rst \)

A. \( v = rst - u \)  B. \( v = \frac{1}{u} - rst \)
C. \( v = u(-rst) \)  D. \( v = \frac{rst}{u} \)

24. Which equations are equivalent:

I. \( 2x - 3 = 5x + 7 \)  II. \( 2x - 2 = 5x - 12 \)  III. \( 2x + 3 = 5x - 7 \)  IV. \( 4x - 6 = 10x + 14 \)

A. Equations I & III  B. Equations III & IV
C. Equations I & IV  D. Equations II & III
25. A company wishes to produce and sell calculators. The company invests $500,000 in starting the business and calculates each calculator will cost a further $20.00 to make. They decide to sell each calculator at a price of $25.00. What is the least number of calculators that need to be sold in order to make a profit?

A. 11,111  
B. 100,000  
C. 25,000  
D. 20,000

26. Which is the correct graph of the system of equations?

\[ \begin{align*}
  y &= 2x - 1 \\
  y &= -2x + 3
\end{align*} \]

A.  
B.  
C.  
D.  
27. At the end of the 2000 baseball season, the New York Yankees and the Cincinnati Reds had won a total of 31 World Series. The Yankees had won 5.2 times as many World Series as the Reds. How many World Series did each team win?

A. New York Yankees = 26  
   Cincinnati Red = 5
B. New York Yankees = 5  
   Cincinnati Red = 26
C. New York Yankees = 6  
   Cincinnati Red = 25
D. New York Yankees = 25  
   Cincinnati Red = 6

28. The manager of a movie theater found that Saturday’s sales were $3675. He knew that a total of 650 tickets were sold Saturday. Adult tickets cost $7.50, and children’s tickets cost $4.50. How many of each kind of ticket were sold?

A. 400 adult tickets  
   250 children’s tickets
B. 490 adult tickets  
   160 children’s tickets
C. 306 adult tickets  
   344 children’s tickets
D. 250 adult tickets  
   400 children’s tickets

29. Which graph represents the following system of inequalities?

\[
\begin{align*}
  y &\leq 2x + 1 \\
  2x - 5y &\leq 10
\end{align*}
\]

A.  
B.  
C.  
D.  
ANSWER KEY

1. C
2. B
3. C
4. A
5. A
6. B
7. A
8. A
9. D
10. D
11. B
12. C
13. C
14. B
15. A
16. B
17. D
18. C
19. C
20. A
21. A
22. B
23. D
24. C
25. B
26. C
27. A
28. D
29. B