Solving Equations and Inequalities

1. (A.5A) Solve for \( x \):
   \[-3(2k - 3) = 20 - 4k\]
   \[
   A. \quad x = \frac{11}{10} \\
   B. \quad x = \frac{11}{2} \\
   C. \quad x = -\frac{11}{2} \\
   D. \quad x = -\frac{11}{10}
   \]

2. (A.5A) Examine the problem below. Which step contains the first error?
   \[7y - 3(7y - 2) + 5 = -73\] original equation
   \[7y - 21y - 6 + 5 = -73\] Step 1
   \[-14y - 1 = -73\] Step 2
   \[-14y = -72\] Step 3
   \[x = \frac{36}{7}\] Step 4
   \[
   A. \quad \text{Step 1} \\
   B. \quad \text{Step 2} \\
   C. \quad \text{Step 3} \\
   D. \quad \text{Step 4}
   \]

3. (A.5A) Solve the equation \( 21y + 18 = 12y \)
   \[
   A. \quad y = 2 \\
   B. \quad y = -2 \\
   C. \quad y = \frac{11}{6} \\
   D. \quad y = -\frac{11}{6}
   \]

4. (A.5A) In one baseball season, Jaime hit twice the difference of the number of home runs Alice hit and 10. Altogether, they hit 28 home runs. How many home runs did Alice hit?
   \[
   A. \quad 16 \\
   B. \quad 14 \\
   C. \quad 12 \\
   D. \quad 8
   \]

5. (A.5B) \( 3(n - 2) - 5n + 10 > 0 \)
   \[
   A. \quad n > 2 \\
   B. \quad n < 2 \\
   C. \quad \text{No solution} \\
   D. \quad n > -3
   \]

6. (A.12E) Solve the following literal equation for \( c \).
   \[Q = 3a + 5c\]
   \[
   A. \quad c = \frac{Q + 5}{3a} \\
   B. \quad c = \frac{Q + 3a}{5} \\
   C. \quad c = \frac{Q - 3}{3a} \\
   D. \quad c = \frac{Q - 3a}{5}
   \]

Domain and Range

7. (A.2A) Which graph shows a function with a domain of all real numbers greater than 7?
   \[
   A. \\
   B. \\
   C. \\
   D.
   \]
8. (A.2A) Rental cars at ABC Rental Car Company cost $50 to rent, plus $2 per mile (partial miles round up). This function can be represented by the equation \( M(d) = 2d + 50 \) where \( d \) = distance traveled and \( M \) = money spent. What is the range of this function?

A. \( R: -\infty < y < \infty \)
B. \( R: \{0, 1, 2, 3 \ldots \} \)
C. \( R: y \geq 0 \)
D. \( R: 50, 52, 54, 56 \ldots \}

9. (A.2A) Which situation is NOT discrete data (It is continuous)?

A. The number of problems you have for homework.
B. The number of pages in a dictionary.
C. The temperatures throughout the week.
D. The numbers of TV’s in your house.

10. (A.2A) A storm is headed through North Texas. The duration of the storm is measured in hours while the rainfall is measured in inches as seen in the table below.

<table>
<thead>
<tr>
<th>Duration of the storm (hrs), ( x )</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of rain (inches), ( y )</td>
<td>2.5</td>
<td>5</td>
<td>7.5</td>
</tr>
</tbody>
</table>

What would the range be for this scenario?

A. \( y = \{2.5,5,7.5\} \)
B. \( y \geq 2.5 \)
C. \( y \geq 0 \)
D. \( y \leq 7.5 \)

11. (A.2A) What would the domain be for this scenario?

A. \( x = \{1,2,3\} \)
B. \( x \geq 1 \)
C. \( x \geq 0 \)
D. \( x \leq 3 \)

12. (A.2A) A scientist is keeping data on the growth of a tree over a period of time. What would be the most reasonable range?

A. All real numbers
B. \( x \geq 0 \)
C. \( y \geq 0 \)
D. \( y \leq 0 \)

Functions and Sequences

13. (A.12A) Which graphs are functions (more than one answer)?

A. 
B. 
C. 
D.
14. (A.12B) Evaluate $f(x) = -3x + 9$ for $f(-5)$ and $f(1)$.

A. $-3,9$
B. $0,9$
C. $-5,1$
D. $24,6$

15. (A.12C) Find the 20$^{th}$ term of the sequence defined by the given rule: $f(1) = 8, f(n)=f(n - 1) + 2$

A. 2
B. 22
C. 28
D. 46

16. (A.12D) Tai wrote the sequence $-4, -2, 0, 2$ . . . . . .

What is the function rule?

A. $f(n) = 2n - 6$
B. $f(n) = -4n$
C. $f(n) = 2n$
D. $f(n) = 6n - 2$

Slope and Rate of Change

17. (A.3A) Determine the slope of the line represented by the table below.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5</td>
<td>-23</td>
</tr>
<tr>
<td>-2</td>
<td>-11</td>
</tr>
<tr>
<td>-1</td>
<td>-7</td>
</tr>
<tr>
<td>0</td>
<td>-3</td>
</tr>
</tbody>
</table>

A. $-4$
B. $-\frac{1}{4}$
C. 4
D. $-12$

18. (A.3B) A plane is descending from 30,500 feet at a speed of 3500 feet per minutes.

What is the rate of change?

A. Rate of change is 30,500 feet.
B. Rate of change is 3500 feet per minute.
C. Rate of change is 3500 feet
D. Rate of change is 3500 minutes.

19. (A.3B) Below is how a table of Joe’s earnings. How much does he make per hour?

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
</tr>
<tr>
<td>4</td>
<td>85</td>
</tr>
</tbody>
</table>

Record your answer and fill in the bubbles on the answer document.

20. (A.3B) The following represents the graph for a helium balloon’s flight. Determine the rate of change of the graph.

A. 1 mile per hour
B. 40 miles per hour
C. .5 mile per hour
D. 40 hour per mile

Graphs and Transformations

21. (A.2C) Which is the equation of the line graphed below?

A. $-2x + y = 2$
B. $2x - y = -2$
C. $x + 2y = 4$
D. $x - 2y = 4$
22. (A.3C) Which line represents the equation 
\(-3x - 2y = 4\)?

23. (A.3C) Determine the \(x\) – and \(y\) – intercepts from the following equation: 
\(-2x + 2y = -4\)

24. (A.3C) A submarine is 30,000 feet below the sea level, it begins ascending at the rate of 40 feet per hour. Assume the submarine continues at the same rate of ascent. The submarines height and minutes below the ground are related to each other. What does the \(x\) –intercept represent in this situation?

25. (A.3C) The graph of the linear equation 
\(y = 2x - 2\) is shown below. What would the zero be?

26. (A.3A) Given: \(3x - y = -1\), what is the slope?

27. (A.3E) Below is the linear parent function.

What will happen to the line if the slope is tripled?

28. (A.2B) Write the equation of the line containing point \((5, -3)\) and a slope of 2.
29. (A.2C) Natasha and her friends go out for yogurt. They decide to create their own yogurt, which costs $3 plus $.50 per topping. If \( x \) represents the number of toppings on the yogurt, then which equation describes \( y \), the total cost for the yogurt?

A. \( y = .5 + 3x \)
B. \( y = 3 + .5x \)
C. \( x = .5y + 3 \)
D. \( y = 8.50x \)

30. (A.2C) Which equation creates the table below?

<table>
<thead>
<tr>
<th>( x )</th>
<th>3</th>
<th>6</th>
<th>9</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

A. \( y = 2x + 3 \)
B. \( y = 3x + 2 \)
C. \( y = \frac{1}{3}x + 2 \)
D. \( y = \frac{1}{3} + 2x \)

31. (A.2C) Write the equation for the line below.

A. \( y = \frac{1}{2}x + 1 \)
B. \( y = -\frac{1}{2}x + 1 \)
C. \( y = -2x + 1 \)
D. \( y = 2x + 1 \)

32. (A.2D) In an equation, \( y \) varies directly with \( x \). If \( x = 7 \) when \( y = 21 \), what is the value of \( x \) when \( y = 30 \)?

Record your answer and fill in the bubbles on the answer document.
ANSWER KEY