Review for Algebra 1 Midterm Exam

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Use the vertical line test to determine which of the following relations is a function.
   a. 
   b. 
   c. 
   d. 

2. Evaluate \( f(x) = -2x - 5 \) for \( x = 3 \).
   a. -11  
   b. 1  
   c. -6  
   d. 11
3. Identify the mapping diagram that represents the relation and determine whether the relation is a function. 
\{(-3, -6), (-1, -6), (5, -6), (8, -6)\}

a. The relation is not a function.

b. The relation is not a function.

c. The relation is a function.

d. The relation is a function.
4. Identify the mapping diagram that represents the relation and determine whether the relation is a function.
\[\{-8, -6\}, \{-5, 2\}, \{-8, 1\}, \{7, 3\}\]

- a. The relation is a function.
- b. The relation is a function.
- c. The relation is not a function.
- d. The relation is not a function.

<table>
<thead>
<tr>
<th>(x)</th>
<th>(f(x))</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>-8</td>
</tr>
<tr>
<td>3</td>
<td>-12</td>
</tr>
<tr>
<td>4</td>
<td>-16</td>
</tr>
<tr>
<td>5</td>
<td>-20</td>
</tr>
</tbody>
</table>

- a. \(f(x) = -4x\)
- b. \(f(x) = 4x\)
- c. \(f(x) = x - 4\)
- d. \(f(x) = x + 4\)

6. | \(x\) | \(f(x)\) |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
</tr>
</tbody>
</table>

- a. \(f(x) = x - 4\)
- b. \(f(x) = 4x\)
- c. \(f(x) = x + 4\)
- d. \(f(x) = -4 - x\)
7. A zucchini plant in Darnell’s garden was 10 centimeters tall when it was first planted. Since then, it has grown approximately 0.5 centimeters per day.
   a. Write a rule to describe the function.
   b. After how many days will the zucchini plant be 0.185 meters tall?

   a. \( h(d) = 0.5d + 10 \); 17 days
   b. \( h(d) = 10d + 0.5 \); 1.1 days
   c. \( h(d) = \frac{d}{0.5} + 10 \); 4 days
   d. \( h(d) = 0.5d \); 37 days

8. Which of these data sets represents a function?
   a. [Diagram 1]
   b. [Diagram 2]
   c. [Diagram 3]
   d. [Diagram 4]

9. Given the function, \( f(x) = 25x + 750 \), what is the range of this function when the domain is \( \{2, 4, 6, 8, 10\} \)?
   a. \( \{750, 800, 850, 900, 950\} \)
   b. \( \{775, 800, 825, 850, 875\} \)
   c. \( \{800, 825, 850, 750, 775\} \)
   d. \( \{800, 850, 900, 950, 1,000\} \)

10. What is the range of the graph below?

   a. \( -4 \leq y \leq 3 \)
   b. \( -3 \leq x \leq 4 \)
   c. \( \{-3, -2, -1, 1, 4\} \)
   d. \( \{-4, -1, 1, 2, 3\} \)
11. What is the domain of the graph below?

a. \(-4 \leq y \leq 3\)
b. \(-3 \leq x \leq 4\)
c. \{-3, -2, -1, 1, 4\}
d. \{-4, -1, 1, 2, 3\}

12. Sawyer dropped one marble at a time into a cylinder containing water. The data set he collected is represented by the scatterplot below.

Assume the cylinder did not overflow. What is the best prediction of the height, in centimeters, of the water after a total of 14 marbles is dropped?

a. 34  
   
   b. 36
   
   c. 38
   
   d. 40
13. What is the range of the function graphed below?

a. \{0, 1, 4, 7, 10\}  
   c. \(0 \leq y \leq 8\)

b. \(0 \leq x \leq 10\)  
   d. \{0, 5, 8\}

14. What is the domain of the function graphed below?

a. \{0, 1, 4, 7, 10\}  
   c. \(0 \leq y \leq 8\)

b. \(0 \leq x \leq 10\)  
   d. \{0, 5, 8\}

15. The table shows the relationship between the cost, \(c\), in dollars of a taxi ride and the number \(t\), of minutes the ride lasts.

<table>
<thead>
<tr>
<th>(t)</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>(c)</td>
<td>$4.75$</td>
<td>$6.50$</td>
<td>$8.25$</td>
<td>$10$</td>
</tr>
</tbody>
</table>

Which equation algebraically represents this data?

a. \(c = 3 + 0.35t\)  
   c. \(c = t - 0.25\)

b. \(c = 2.75 + 0.5t\)  
   d. \(c = 4 + 0.15t\)
16. Which equation most likely describes the relation indicated by the table?

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>-2</td>
</tr>
</tbody>
</table>

a. \( y = x + 4 \)  

b. \( y = x - 2 \)  

c. \( y = -x + 4 \)  

d. \( y = -x - 8 \)  

17. Which of the following does NOT represent a function of \( x \)?

<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>1</th>
<th>1</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

a. \[
\begin{array}{c|cccc}
  x & 1 & 1 & 1 & 4 \\
  y & 1 & 2 & 3 & 4 \\
\end{array}
\]

c. \[
\begin{array}{c|cccc}
  x & 1 & 2 & 3 & 4 \\
  y & 2 & 2 & 4 & 5 \\
\end{array}
\]

b. \[
\begin{array}{c|cccc}
  x & 1 & 2 & 3 & 4 \\
  y & 1 & 1 & 1 & 1 \\
\end{array}
\]

d. \[
\begin{array}{c|cccc}
  x & 0 & 2 & 5 & 3 \\
  y & 7 & 3 & 0 & 2 \\
\end{array}
\]

18. The graph shows part of a function \( f \). The arrowheads indicate that the graph continues forever in those directions.

What is the range of the function?

a. All real numbers  

b. All real numbers less than or equal to \( 5 \)  

c. All real numbers greater than zero  

d. All real numbers between 2 and 6

19. the sum of \( b \) and 11

a. \( b - 11 \)  

b. \( \frac{b}{11} \)  

c. \( b + 11 \)  

d. \( 11b \)  

20. the product of \( g \) and 4

a. \( 4g \)  

b. \( g + 4 \)  

c. \( \frac{g}{4} \)  

d. \( g - 4 \)  

21. the quotient of 6 times a number and 16

a. \( \frac{16x}{6} \)  

b. \( \frac{6x}{16} \)  

c. \( 96x \)  

d. \( \frac{x}{96} \)  

22. 4 minus a number

a. \( 4 - n \)  

b. \( 4n \)  

c. \( \frac{4}{n} \)  

d. \( \frac{n}{4} \)
23. $d + 0.7 = 0.9$

   a. 0.2   b. –1.6   c. –0.2   d. 1.6

24. $37 - 18 + 8w = 67$

   a. –6   b. 4   c. 7   d. 6

25. $3(y + 6) = 30$

   a. 5   b. 16   c. 4   d. –16

26. $4.9x + 4.4 = 19.1$

   a. 4   b. 3   c. 4.8   d. 7.2

27. $5x - 5 = 3x - 9$

   a. –2   b. 1   c. –1   d. –3

28. $8d - 4d - 6d - 8 = 2d$

   a. 0   b. –1   c. –2   d. –4
29. \( h + 9 = 2(4h - 8) \)

\[
\begin{align*}
\text{a. } & \frac{9}{4} \\
\text{b. } & \frac{7}{25} \\
\text{c. } & 2 \\
\text{d. } & \frac{25}{7}
\end{align*}
\]

30. \( \frac{v}{4} = -10 \)

\[
\begin{align*}
\text{a. } & -\frac{21}{2} \\
\text{b. } & -14 \\
\text{c. } & 40 \\
\text{d. } & -40
\end{align*}
\]

31. \( \frac{3}{8}x = 27 \)

\[
\begin{align*}
\text{a. } & 65 \\
\text{b. } & 13 \\
\text{c. } & 81 \\
\text{d. } & 72
\end{align*}
\]

32. \( 9d = -54 \)

\[
\begin{align*}
\text{a. } & 6 \\
\text{b. } & -9 \\
\text{c. } & -5 \\
\text{d. } & -6
\end{align*}
\]

33. \( \frac{3}{7}x + 5 = 8 \)

\[
\begin{align*}
\text{a. } & 7 \\
\text{b. } & \frac{12}{7} \\
\text{c. } & -7 \\
\text{d. } & \frac{72}{3}
\end{align*}
\]

34. \( x \geq -3 \)

\[
\begin{align*}
\text{a. } & \text{Diagram a} \\
\text{b. } & \text{Diagram b} \\
\text{c. } & \text{Diagram c} \\
\text{d. } & \text{Diagram d}
\end{align*}
\]

35. \( c - 3 > 6 \)

\[
\begin{align*}
\text{a. } & c < -9 \\
\text{b. } & c > 9 \\
\text{c. } & c > 3 \\
\text{d. } & c > -9
\end{align*}
\]
36. \(-2w < -18\)
   a. \(w > 9\)
   b. \(w < -16\)
   c. \(w < 9\)
   d. \(w > -16\)

37. \(2x \geq 8\)
   a. \(x \geq 4\)
   b. \(x \geq -6\)
   c. \(x \leq 4\)
   d. \(x > 6\)

38. \(12 + 10w \geq 8(w + 12)\)
   a. \(w \geq -42\)
   b. \(w \geq 48\)
   c. \(w \geq 42\)
   d. \(w \geq 54\)

39. \(11d - 9 \leq 15d + 3\)
   a. \(d \geq \frac{6}{13}\)
   b. \(d \geq \frac{3}{13}\)
   c. \(d \geq -\frac{1}{2}\)
   d. \(d \geq -3\)

40. \(2(b - 8) > 12\)
   a. \(b > 20\)
   b. \(b > 6\)
   c. \(b > 14\)
   d. \(b < 20\)
41. Find the slope of the line.

\[ y = \frac{4}{3}x - 3 \]

a. \( \frac{3}{2} \)   b. \( \frac{4}{3} \)   c. \( \frac{3}{4} \); 3   d. 4

42. Find the slope of the line that passes through the points \((1, 7), (10, 1)\)

a. \( \frac{3}{2} \)   b. \( \frac{2}{3} \)   c. \( \frac{3}{2} \)   d. \( \frac{2}{3} \)

43. \( 14x + 4y = 24 \)

a. \( \frac{2}{7}; 6 \)   b. \( \frac{7}{2}; 6 \)   c. \( \frac{7}{2}; -6 \)
45. Graph the equation.
\[ y = \frac{3}{4}x - 3 \]

46. \(-3x + 9y = 18\); Find the x-intercept and y-intercept of the line.

- a. x-intercept is 2; y-intercept is -6.
- b. x-intercept is -3; y-intercept is 9.
- c. x-intercept is -6; y-intercept is 2.
- d. x-intercept is 9; y-intercept is -3.

47. Find an equation of the line with slope 9 and y-intercept 3.

- a. \( y = \frac{1}{3}x + 9 \)
- b. \( y = 9x + 3 \)
- c. \( y = 3x + 9 \)
- d. \( y = 3x - 3 \)

48. Find the equation of the line in point-slope form that passes through \((10, -9)\) and has a slope of \(m = -2\)

- a. \( y - 10 = -2(x + 9) \)
- b. \( y - 9 = -2(x + 10) \)
- c. \( y - 9 = -2(x - 10) \)
- d. \( y + 9 = -2(x - 10) \)
49. Write the equation that describes the line in slope-intercept form. Slope = 4, point (3, -2) is on the line
   a. \( y = 4x + 14 \)  
   b. \( y = 4x - 14 \)  
   c. \( y = 4x + 10 \)  
   d. \( y = 4x - 2 \)

50. You start with $200 in a checking account. Each month, you withdraw 20 dollars. Write an equation to model the amount of money in the checking account.
   a. \( y = 20x + 200 \)  
   b. \( y = 200x + 20 \)  
   c. \( y = -20x + 200 \)  
   d. \( y = -200x + 20 \)