PreAssessment Linear Unit

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

For the questions below, use the following functions:

\[ f(x) = 3x - 5 \]
\[ g(x) = -x + 7 \]
\[ h(x) = 5 - 7x \]
\[ k(x) = \frac{1}{2}x + 4. \]

____ 1 Find \( f(3) \).

A 4  
B 14  
C -16  
D 5.5

____ 2 Find \( f \cdot g(4) \).

A 51  
B 77  
C 21  
D 10

____ 3 Find \( h + k(x) \).

A \(-6.5x + 9\)  
B \(-7.5x + 9\)  
C \(5.5x - 3\)  
D \(7.5x - 1\)

____ 4 Find \( f(x) - g(x) \).

A \(-4x + 12\)  
B \(-4x - 2\)  
C \(4x + 2\)  
D \(4x - 12\)
5 Find the inverse of the function \( y = 3x - 4 \). Is the inverse a function?

A \( y = 3x + 4 \); no it is not a function.  \( y = \frac{1}{3}x + 4 \); yes it is a function

B \( y = \frac{1}{3}x + \frac{4}{3} \); yes it is a function.  \( y = \frac{1}{3}x - \frac{4}{3} \); no it is not a function

6 Find the inverse of the set of points: \( \{(1,2), (3,4), (-1,5), (-3,-7), (4,4)\} \). Is the inverse a function?

A \( \{(2,1), (4,3), (5,-1), (-7,-3), (4, -6)\} \); yes, it is a function

B \( \{(1,2), (4,3), (-1,5), (-7,-3), (4, -6)\} \); yes, it is a function

C \( \{(2,1), (4,3), (5,-1), (-7,-3), (4, -6)\} \); no, it is not a function

D \( \{(1,2), (4,3), (-1,5), (-7,-3), (4, -6)\} \); no, it is not a function

7 Solve the equation \( 4x - 3(x + 2) = 0 \). What does this tell you about the graph of the function \( y = 4x - 3(x+2) \)?

A \( x = 6 \); the graph will have an x-intercept at 6.  \( x = -6 \); the graph will have an x-intercept at -6.

B \( x = 6 \); the graph will have a y-intercept at 6.  \( x = -6 \); the graph will have a y-intercept at -6.

8 When solving the equation \( 3x - 4(x+2) = 6 \) for \( x \), what property will allow you to eliminate the parentheses?

A Associative Property of Multiplication  C Distributive Property

B Parentheses Property of Multiplication  D Commutative Property of Multiplication
When solving the equation $3x - 4(x+2) = 6$ for $x$, why do you add 8 to both sides of the equation?

A. In order to create 1, additive inverses have the same sign.
B. In order to create 0, additive inverses have different signs.
C. In order to create 0, additive inverses have the same sign.
D. In order to create 1, multiplicative inverses have the same sign.

Solve the equation $3x - 4(x+2) = 6$ for $x$.

A. $x = 14$
B. $x = -2$
C. $x = 2$
D. $x = -14$

Steven wants to buy a $565 bicycle. Steven has no money saved, but will be able to deposit $30 into a savings account when he receives his paycheck each Friday. However, before Steven can buy the bike, he must give his sister $65 that he owes her. For how many weeks will Steven need to deposit money into his savings account before he can pay back his sister and buy the bike?

A. 25 weeks
B. 19 weeks
C. 22 weeks
D. 21 weeks

Which number is a solution of the inequality $3x - 15 \geq 3$?

A. $\frac{9}{11}$
B. 5
C. $\frac{6}{11}$
D. 6
For the following problems, solve the inequality. Then graph your solution.

___ 13 \( \frac{x}{4} \leq 2 \)

A \( x \leq -8 \)

B \( x \leq 6 \)

C \( x \geq 8 \)

D \( x \geq -8 \)

___ 14 \(-2 < 4x - 10 < 6 \)

A \( 4 < x < 12 \)

B \(-3 < x < -1 \)

C \(-16 < x < -8 \)

D \(2 < x < 4 \)

___ 15 Determine if the table below represents a function, then find the domain and range of the table.

<table>
<thead>
<tr>
<th>Age of Person</th>
<th>Books Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>42</td>
</tr>
<tr>
<td>36</td>
<td>37</td>
</tr>
<tr>
<td>29</td>
<td>37</td>
</tr>
<tr>
<td>29</td>
<td>17</td>
</tr>
</tbody>
</table>

A yes it is a function; domain: \{29, 29, 36\}
range: \{17, 37, 42\}

B yes it is a function; domain: \{29, 29, 36\}
range: \{37, 37, 42\}

C no it is not a function; domain: \{29, 36, 65\}
range: \{37, 37, 42\}

D no it is not a function; domain: \{29, 36, 65\}
range: \{17, 37, 42\}
16 Evaluate $f(x) = -2x - 5$ for $x = 3$.

A  -11  B  1  C  -6  D  11

17 Choose the best graph of the equation $y = -2x + 3$, then determine if the graph is a function.

Yes, it is a function

No, it is not a function

Yes, it is a function

No, it is not a function
For the following problems, write a function rule for the table.

___ 18

<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  $f(x) = x + 4$

___ 19

<table>
<thead>
<tr>
<th>x</th>
<th>f(x)</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  $f(x) = -4 - x$

___ 20 Write a function rule that gives the total cost $c(p)$ of $p$ pounds of sugar if each pound costs $.59.

A  $c(p) = 59c$  C  $c(p) = p + 0.59$

B  $c(p) = \frac{p}{0.59}$  D  $c(p) = 0.59p$

___ 21 The amount of a person’s paycheck $p$ varies directly with the number of hours worked $t$. For 16 hours of work, the paycheck is $124.00. Write an equation for the relationship between hours of work and pay.

A  $p = 77.50t$  B  $p = t + 77.50$  C  $p = 7.75t$  D  $p = t + 7.75$
22 The rate of change is constant in the table. Find the rate of change. Explain what the rate of change means for the situation.

<table>
<thead>
<tr>
<th>Time (hours)</th>
<th>Distance (miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>260</td>
</tr>
<tr>
<td>6</td>
<td>390</td>
</tr>
<tr>
<td>8</td>
<td>520</td>
</tr>
<tr>
<td>10</td>
<td>650</td>
</tr>
</tbody>
</table>

A 10; Your car travels for 10 hours.
B 260; Your car travels 260 miles.
C \(\frac{65}{1}\); Your car travels 65 miles every 1 hour.
D \(\frac{1}{65}\); Your car travels 65 miles every 1 hour.
23. The rate of change is constant in the graph. Find the rate of change. Explain what the rate of change means for the situation.

- **A** -100; value drops $100 every year.
- **B** \(-\frac{100}{3}\); value drops $100 every 3 years.
- **C** -3; value drops $3 every year.
- **D** -1; value drops $1 every year.

For the following problems, find the slope and \( y \)-intercept of the line.

24. \( y = \frac{4}{3}x - 3 \)

- **A** 3; \( \frac{4}{3} \)
- **B** -3; \( \frac{4}{3} \)
- **C** \( \frac{3}{4} \); 3
- **D** \( \frac{4}{3} \); -3

25. \( 14x + 4y = 24 \)

- **A** \( \frac{2}{7} \); 6
- **B** \( \frac{7}{2} \); 6
- **C** \( \frac{7}{2} \); \( \frac{1}{6} \)
- **D** \( \frac{7}{2} \); -6
26 Write an equation of a line with a slope of 1 and y-intercept of 4.

A  \( y = 4x + 1 \)  
B  \( y = x - 4 \)  
C  \( y = -1x + 4 \)  
D  \( y = x + 4 \)

27 Write the slope-intercept form of the equation for the line.

A  \( y = 3x - 1 \)  
B  \( y = -3x - 1 \)  
C  \( y = \frac{1}{3}x + 1 \)  
D  \( y = \frac{1}{3}x - 1 \)
Giselle pays $210 in advance on her account at the athletic club. Each time she uses the club, $10 is deducted from the account. The situation can be modeled by the equation
\[ b = 210 - 10x, \]
where \( x \) is the number of visits and \( b \) is the total account balance.
Select the graph that represents this situation and the correct balance after 8 visits.

A
![Graph A]

B
![Graph B]

C
![Graph C]

D
![Graph D]
29 Find the x- and y-intercept of the line with equation \(-3x + 9y = 18\).

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.

30 Choose the correct graph, domain and range for the equation \(-7x + 7y = -49\).

A  Domain: \(\{x \mid x \in \mathbb{R}\}\)  
   Range: \(\{y \mid y \in \mathbb{R}\}\)  
B  Domain: \(\{x \mid x \geq -10\}\)  
   Range: \(\{y \mid y \geq -3\}\)  
C  Domain: \(\{x \mid x \in \mathbb{R}\}\)  
   Range: \(\{y \mid y \in \mathbb{R}\}\)  
D  Domain: \(\{x \mid x \geq -10\}\)  
   Range: \(\{y \mid y \geq -3\}\)
Which equation represents \( y = \frac{2}{3}x + 7 \) in standard form with integer coefficients?

A. \(-2x + 3y = 21\)
B. \(3x - 2y = 21\)
C. \(-2x - 3y = 21\)
D. \(-2x + 3y = 7\)
32 Choose the correct graph of the equation \( y + 5 = -(x + 2) \), then state the transformation of the parent function \( y = x \).

A. The parent function is reflected, then shifted right 2 and up 5.

B. The parent function is shifted right 2 and down 5.

C. The parent function is reflected, then shifted left 2 and up 5.

D. The parent function is reflected, then shifted left 2 and down 5.
33 Write an equation in point-slope form for the line through the point (10, -9) with a slope of -2.

A $y - 10 = -2(x + 9)$  
B $y - 9 = -2(x + 10)$  
C $y - 9 = -2(x - 10)$  
D $y + 9 = -2(x - 10)$

34 In February, you have a balance of $270 in your bank account. Each month you deposit $45. Let January = 1, February = 2, and so on. Write an equation for this situation. Use the equation to find the balance in June.

A $y - 270 = 45(x - 2); $450  
B $y = 45(x - 4); $270  
C $y = 45(x - 4); $180  
D $y - 270 = 45x; $45

For the following problems, determine if the graphs of the lines are parallel and explain.

35 $y = \frac{1}{6}x + 8$  
-2x + 12y = -11

A Yes, since the slope are the same and the y-intercepts are the same.  
B No, since the y-intercepts are different.  
C Yes, since the slopes are the same and the y-intercepts are different.  
D No, since the slopes are different.

36 $y = 5x + 6$  
-18x + 3y = -54

A No, since the slopes are different.  
B Yes, since the slopes are the same and the y-intercepts are different.  
C No, since the y-intercepts are different.  
D Yes, since the slope are the same and the y-intercepts are the same.
37  Tell whether the lines for the equations below are parallel, perpendicular, or neither.

\[ y = \frac{1}{4}x + 10 \]
\[ 16x + 4y = 16 \]

A  neither    B  perpendicular    C  parallel

38  Write the equation of a line that is perpendicular to the line given by the equation \(8x + 12y = 13\) and passes through the point (6, 8).

A  \(y = \frac{2}{3}x - 6\)    B  \(y = -\frac{3}{2}x - 1\)

C  \(y = \frac{2}{3}x - 1\)    D  \(y = \frac{3}{2}x - 1\)
Tom has a collection of 30 CDs and Nita has a collection of 12 CDs. Tom is adding 2 CDs a month to his collection while Nita is adding 4 CDs a month to her collection. Select the graph and system to find the number of months after which they will have the same number of CDs. Let $x$ represent the number of months and $y$ the number of CDs.

A: $y = 2x + 30$
   
   $y = 4x + 12$  

B: $y = -2x + 30$
   
   $y = 4x + 12$  

C: $y = 2x + 12$
   
   $y = 4x + 30$  

D: $y = 2x + 30$
   
   $y = 12x + 4$  

9 months

48 months

3 months

3 months
40  Find a solution to the following system of equations.

\[-5x + y = -5\]
\[-4x + 2y = 2\]

A  (-8, -15)    B  (-2, -15)    C  (0, 1)    D  (2, 5)

41  Which graph represents the following system of equations?

\[y = 3x + 3\]
\[y = -x - 3\]
42. What is the solution of the system of equations?

\[ y = 3x + 7 \]
\[ y = x - 9 \]

A (–1, –10)  B (–17, –8)  C (4, 19)  D (–8, –17)

43. What is the solution of the system of equations?

\[ x + 2y = -6 \]
\[ 3x + 8y = -20 \]

A (–1, –4)  B (–4, 4)  C (–4, –1)  D (3, 1)

44. For the following problems, tell whether the system has no solution, one solution, or infinitely many solutions. (You may want to graph them.)

\[ y = 5x - 4 \]
\[ y = 5x - 5 \]

A no solutions  B one solution  C infinitely many solutions

45. Mike and Kim invest $14,000 in equipment to print yearbooks for schools. Each yearbook costs $7 to print and sells for $35. How many yearbooks must they sell before their business breaks even?

A 650  B 2,000  C 500  D 400
For the following problems, choose the correct graph of the inequality.

____  46  \( y < 4x - 2 \)
47. \(4x + 6y \geq 10\)
\[ y > -5x + 3 \]
Choose the correct linear inequality shown in the graph.

A \( y \geq -3x + 4 \)   B \( y \leq -3x + 4 \)   C \( y \geq -3x - 4 \)   D \( y \leq -3x - 4 \)
You have $47 to spend at the music store. Each cassette tape costs $5 and each CD costs $10. Write and graph a linear inequality that represents this situation. Let $x$ represent the number of tapes and $y$ the number of CDs.

A  $5x + 10y \geq 47$

B  $10x + 5y \geq 47$

C  $10x + 5y \leq 47$

D  $5x + 10y \leq 47$
For the following problems, choose the correct graph of the equation.

51  \( y = -3 \)
\[ x = -4 \]