System of Linear Equations Practice

1. Is (-3, 1) the solution to the linear system $x - 10y = -13$ and $4x + y = -11$. Justify.

2. The perimeter of a rectangle is 16 feet. If the length is three times as large as the width, a linear system to describe this situation is

   A) $2L + 2W = 16$ and $L = 3 + W$

   B) $2L + 2W = 16$ and $W = 3 + L$

   C) $2L + 2W = 16$ and $L = 3W$

   D) $2L + 2W = 16$ and $W = 3L$

Use the following information to answer the next question.

A spring concert had a total of 85 people in attendance. The adult tickets sold for \$5 each, and the child tickets sold for \$3.50 each. The total money collected at the door was \$395.

3. The linear system to model this scenario would be

   A) $A + C = 85$ and $5A + 3.5C = 395$

   B) $A + C = 85$ and $3.5A + 5C = 395$

   C) $A + C = 395$ and $5A + 3.5C = 85$

   D) $A + C = 395$ and $3.5A + 5C = 85$

4. The ordered pair $(x, -2)$ is a solution for the linear system

   $x - y = 12$

   $-2x = 3y - 14$

   The value for x is _____.

5. John used this linear system to represent a situation involving a collection of $2 and $1 dollar coins:

   $2T + 1L = 107$

   $T + L = 62$

   The total number of coins is ____.

Use the following information to answer the next question.

Leanne was asked to verify that (0,6) is the solution for the linear system

$5x + 2y = 12$

$3x - y = 6$

Her work is shown below.

$5x + 2y = 12$

$5(0) + 2(6) = 12$

$0 + 12 = 12$

$12 = 12$

6. Did Leanne correctly verify the solution? Explain.

System of Linear Equations PracticeSolutions

1. Is (-3, 1) the solution to the linear system $x - 10y = -13$ and $4x + y = -11$. Justify.

Solution

Substitute $x = -3$ and $y = 1$ for these variables in both equations.

$x - 10y = -13$	$4x + y = -11$
$(-3) - 10(1) = -13$	$4(-3) + 1 = -11$
$-3 - 10 = -13$	$-12 + 1 = -11$
$-13 = -13$	$-11 = -11$

Since both equations are satisfied, (-3,1) is the solution to the linear system.

2. The perimeter of a rectangle is 16 feet. If the length is three times as large as the width, a linear system to describe this situation is

A) $2L + 2W = 16$	and	$L = 3 + W$
B) $2L + 2W = 16$	and	$W = 3 + L$
C) $2L + 2W = 16$	and	$L = 3W$
D) $2L + 2W = 16$	and	$W = 3L$

The correct answer is C.

Use the following information to answer the next question.

A spring concert had a total of 85 people in attendance. The adult tickets sold for $5 each, and the child tickets sold for $3.50 each. The total money collected at the door was $395.

3. The linear system to model this scenario would be

   A) $A + C = 85$ and $5A + 3.5C = 395$

   B) $A + C = 85$ and $3.5A + 5C = 395$

   C) $A + C = 395$ and $5A + 3.5C = 85$

   D) $A + C = 395$ and $3.5A + 5C = 85$

Solution

Let A = Number of adults and Let C = Number of children

The total number of children and adults is 85. Therefore, $A + C = 85$.

The total money collected at the door is found by multiplying $5 by every adult ticket, and adding this to $3.50 multiplied by every child ticket. Therefore, $5A + 3.5C = 395$.

The correct answer is A.

4. The ordered pair (x, -2) is a solution for the linear system

   $x - y = 12$

   $-2x = 3y - 14$

   The value for x is __10__.

Solution

We know that the y coordinate will be (-2) for each equation. Select either equation, substitute (-2) for y and solve for x.

$x - (-2) = 12$

$x + 2 = 12$

$x = 10$

To confirm, or verify the answer, the point (10, -2) should satisfy the other equation.

$-2(10) = 3(-2) -14$

$-20 = -6 - 14$

$-20 = -20$

5. John used this linear system to represent a situation involving a collection of $2 and $1 dollar coins:
   $2T + 1L = 107$
   $T + L = 62$
   The total number of coins is _62__.

Solution

Let T = Number of Toonies and Let L = Number of Loonies

The total amount of money is determined by the sum of all toonies multiplied by 2 and all loonies multiplied by 1. The equation for the total amount of money is $2T + 1L = 107$.

The equation for the total number of coins is $T + L = 62$.

Use the following information to answer the next question.

Leanne was asked to verify that (0,6) is the solution for the linear system

$$5x + 2y = 12$$
$$3x - y = 6$$

Her work is shown below.

$$5x + 2y = 12$$
$$5(0) + 2(6) = 12$$
$$0 + 12 = 12$$
$$12 = 12$$

6. Did Leanne correctly verify the solution? Explain.

Solution

Leanne is partially correct. She correctly substituted the point (0,6) into the first equation for x and y respectively. She showed that the left side of the equal sign is equal to the right side of the equal sign. Thus, the point **satisfies** this equation.

But, to be a solution, the point must satisfy **both** equations.

$3(0) - (6) = 6$

$0 - 6 = 6$

$-6 \neq 6$

The point (0,6) does **not** satisfy the second equation, so (0,6) is **not** a solution.