Systems of Linear Equations

2

\(2x + 2y = 0\)
\(3x - 3y = 10\)

Which of the following ordered pairs \((x, y)\) satisfies the system of equations above?

A) \((3, -2)\)
B) \((2, -2)\)
C) \((-2, 2)\)
D) \((-2, -2)\)

5

Which ordered pair \((x, y)\) satisfies the system of equations shown below?

\(\begin{align*}
2x - y &= 6 \\
x + 2y &= -2 \\
2x + 2y &= -3 \quad &\text{\underline{add}} \\
4x - 3y &= 12 \quad &\text{\underline{subtract}} \\
x + 2y &= -3
\end{align*}\)

A) \((-6, 2)\)
B) \((-2, 2)\)
C) \((2, -2)\)
D) \((4, 2)\)

9

\(3x + 4y = -23\)
\(2x - x = -19\)

What is the solution \((x, y)\) to the system of equations above?

A) \((-5, -2)\)
B) \((3, -8)\)
C) \((4, -6)\)
D) \((9, -6)\)

\(\begin{align*}
3x - 3y &= -3 \quad &\text{\underline{add}} \\
3x + 4y &= -23 \\
10y &= -80
\end{align*}\)

\(y = -8\)
Getting "No Solution" means that both the x's & y's will eliminate. So, if the y's are the same, then the x's will be equal, too.

To have "Infinitely Many" solutions, the lines are the same line.
In a certain game, a player can solve easy or hard puzzles. A player earns 30 points for solving an easy puzzle and 60 points for solving a hard puzzle. Tina solved a total of 50 puzzles playing this game, earning 1,950 points in all. How many hard puzzles did Tina solve?

A) 10  
B) 15  
C) 25  
D) 35

\[ 30x + 60y = 1950 \]

\[ -30 \cdot (x + y = 50) \]

\[ y = \]

To cut a lawn, Allan charges a fee of $15 for his equipment and $8.50 per hour spent cutting a lawn. Taylor charges a fee of $12 for his equipment and $9.25 per hour spent cutting a lawn. If \( x \) represents the number of hours spent cutting a lawn, what are all the values of \( x \) for which Taylor’s total charge is greater than Allan’s total charge?

A) \( x > 4 \)  
B) \( 3 \leq x \leq 4 \)  
C) \( 4 \leq x \leq 5 \)  
D) \( x < 3 \)

\[ y = 8.50x + 15 \]

\[ y_A = 9.25x + 12 \]

\[ 8.50x + 15 = 9.25x + 12 \]

At a lunch stand, each hamburger has 50 more calories than each order of fries. If 2 hamburgers and 3 orders of fries have a total of 1700 calories, how many calories does a hamburger have?

\[ h = f + 50 \]

\[ 2h + 3f = 1700 \]

\[ 2(f + 50) + 3f = 1700 \]

\[ f = 320 \]

\[ h = 370 \]

\[ b = c \]

\[ b = 2.35 + 0.25x \]

\[ c = 1.75 + 0.40x \]

In the equations above, \( b \) and \( c \) represent the price per pound, in dollars, of beef and chicken, respectively, \( x \) weeks after July 1 during last summer. What was the price per pound of beef when it was equal to the price per pound of chicken?

A) $2.60  
B) $2.85  
C) $2.95  
D) $3.35
Mr. Kohl has a beaker containing \( n \) milliliters of solution to distribute to the students in his chemistry class. If he gives each student 3 milliliters of solution, he will have 5 milliliters left over. In order to give each student 4 milliliters of solution, he will need an additional 21 milliliters. How many students are in the class?

A) 16
B) 21
C) 23
D) 26

Tickets for a school talent show cost $2 for students and $3 for adults. If Chris spends at least $11 but no more than $14 on \( x \) student tickets and 1 adult ticket, what is one possible value of \( x \)?

\[ 4 \leq x \leq 5.5 \]

\[ 3x + b = 5x - 7 \]
\[ 3y + c = 5y - 7 \]

In the equations above, \( b \) and \( c \) are constants.

If \( b \) is \( c \) minus \( \frac{1}{2} \), which of the following is true?

A) \( x \) is \( y \) minus \( \frac{1}{4} \).
B) \( x \) is \( y \) minus \( \frac{1}{2} \).
C) \( x \) is \( y \) minus 1.
D) \( x \) is \( y \) plus \( \frac{1}{2} \).

\[ 2x = b + 7 \]
\[ 2y = c + 7 \]

\[ x = \frac{1}{a} \left( b - \frac{7}{a} \right) \]
\[ y = \left( \frac{1}{2} c + \frac{7}{2} \right) \]

\[ x = \frac{1}{a} c - \frac{1}{4} + \frac{7}{a} \]
\[ x = \frac{1}{2} c + \frac{7}{2} - \frac{1}{4} \]
\[ x = y - \frac{1}{4} \]