1-6 Reteach to Build Understanding

Linear Systems

1. What is the solution to the system of equations shown? The equations have been given letters from (A) to (E) to help identify them. Fill in the blanks to complete the chart.

$$\begin{cases} -x + 2y - 2z = 8 & \text{(A)} \\ x + y + z = 2 & \text{(B)} \\ 2x - 2y + 6z = 12 & \text{(C)} \end{cases}$$

Step	Process	Equations	Simplified Result
Add two equations to eliminate a variable.	(A) + (B) = (D)	$-x + 2y - 2z = 8$ $x + y + z = 2$ $3y - z = 10$	(D) _____
Eliminate the same variable again using another pair of equations.	2(A) + (C) = (E)	$-2x + 4y - 4z = 16$ $2x - 2y + 6z = 12$ _____	(E) $2y + 2z = 28$
Solve to isolate one of the variables in (D) and (E).	2(D) + (E) to isolate y	$6y - 2z = 20$ $2y + 2z = 28$ _____	$8y = 48$ $y =$ __
Substitute the value of y into the equation (E) to find z.	Substitute y (E), to solve for z.	$2(\_) + 2z = 48$	$12 + 2z = 28$ $2z = 28 - 12$ $2z =$ __ $z =$ __
Substitute the value of y and z to solve for x in (B).	Substitute y and z in (B), to solve for x.	$x + (\_) + (\_) = 2$	$x + 14 = 2$ $x =$ __
Finally test your solution (–12, 6, 8) by substituting into each equation and solving.	Substitute x, y, and z into the original equation. (–12, 6, 8)	$-(-12) + 2(6) - 2(8) = 8$ $(-12) + (6) + (8) = 2$ $-2(-12) + 4(6) - 4(8) = 16$	(A) $12 + 12 - 16 = 8$ $8 =$ __ (B) $-12 + 6 + 8 = 2$ $2 =$ __ (C) $24 + 24 - 32 = 16$ $16 =$ __

2. Keegan and Margaret solved the system $4x - y = 5$ and $4x + y = 3$. Keegan says there is no solution and Margaret says the solution is (1, –1). Who is correct? Explain.

Keegan:

$4x - y = 5$
$-4x + y = 3$
$0 \neq 8$
No solution

Margaret:

$4x - y = 5$
$-4x - y = -3$
$-2y = 2$ $y = -1$
$4x + 1 = 5$
$4x = 4$
$x = 1$ (1, –1)

3. Write the augmented matrix for the system of equations.

$$\begin{cases} ax - by = c \\ dx + ey = f \\ gx - hy = i \end{cases} \quad \left[\begin{array}{ccc} a & -b & -c \\ d & e & f \\ g & -h & i \end{array}\right]$$

$$\begin{cases} 2x - 2y = 8 \\ -x + 4y = 5 \\ 3x - y = 6 \end{cases} \quad \left[\begin{array}{ccc} \_ & \_ & 8 \\ \_ & 4 & \_ \\ 3 & \_ & 6 \end{array}\right]$$