Nome: Amanda chen zhen CTII 348

1. a $\begin{cases} 2x - y = 2 \\ -x + 3y = -3 \end{cases}$

$$\left(\begin{array}{cc|c} 2 & -1 & 2 \\ -1 & 3 & -3 \end{array}\right) \sim \left(\begin{array}{cc|c} & & \\ 5 & 0 & 3 \end{array}\right) \div 5 \quad x = 3$$

$$x = \frac{3}{5}$$

$$y = -\frac{4}{5}$$

$$V = \left\{ x = \frac{3}{5} ; y = -\frac{4}{5} \right\}$$

b. $\begin{cases} 3x - y + z = 1 \end{cases}$

$y = \frac{10}{5} - \frac{6}{5}(-1)$

$y = -\frac{4}{5}$

$V = \left\{ x = \frac{3}{5}; y = \frac{-4}{5} \right\}$

b. $\begin{cases} 3x - y + 2 = 1 \\ 2x + 3z = -1 \\ 4x + y - 2z = 7 \end{cases}$

$$\left(\begin{array}{ccc|c} 3 & -1 & 1 & 1 \\ 2 & 0 & 3 & -1 \\ 4 & 1 & -2 & 7 \end{array}\right) \sim \left(\begin{array}{ccc|c} -7 & 3 & 0 & -4 \\ 10 & -1 & 0 & 9 \end{array}\right) \sim \left(\begin{array}{ccc|c} & & & \\ 23 & 0 & 0 & 23 \end{array}\right)$$

$2x + 3z = -1 \quad -7x + 3y = -4 \quad 23x = 23$

$-2 + 3z = -1 \quad -7 + 3y = -4 \quad x = 1$

$3z = -3 \quad 3y = 3$

$z = -1 \quad y = 1$

$V = \{x = 1; y = 1; z = -1\}$

2. $\begin{cases} 3x + 4y - z = 1 \\ 4x + 5y + 2z = 12 \\ x - 2y + 3z = 8 \end{cases}$

$$\begin{pmatrix} 3 & 4 & -1 & 1 \\ 4 & 5 & 2 & 12 \\ 1 & -2 & 3 & 8 \end{pmatrix} \sim \begin{pmatrix} 10 & 13 & 0 & 14 \\ 10 & 10 & 0 & 11 \end{pmatrix} \sim \begin{pmatrix} 0 & 3 & 0 & 3 \end{pmatrix}$$

Letra A

$3y = 3$

$y = 1$

3. $\begin{cases} x + 2y + z = 1 \\ 3x + y - 11z = -2 \\ 2x + 3y - z = 1 \end{cases}$

$$\begin{pmatrix} 1 & 2 & 1 & 1 \\ 3 & 1 & -11 & -2 \\ 2 & 3 & -1 & 1 \end{pmatrix} \sim \begin{pmatrix} 0 & -5 & -14 & -5 \\ 0 & -1 & -3 & -1 \end{pmatrix} \sim \begin{pmatrix} 0 & 0 & 1 & 0 \end{pmatrix}$$

$y = 1$

3. $\begin{cases} x + 2y + z = 1 \\ 3x + y - 11z = -2 \\ 2x + 3y - z = 1 \end{cases}$

$$\left(\begin{array}{ccc|c} 1 & 2 & 1 & 1 \\ 3 & 1 & -11 & -2 \\ 2 & 3 & -1 & 1 \end{array}\right) \sim \left(\begin{array}{ccc|c} & & & \\ 0 & -5 & -14 & -5 \\ 0 & -1 & -3 & -1 \end{array}\right) \sim \left(\begin{array}{ccc|c} & & & \\ & & & \\ 0 & 0 & 1 & 0 \end{array}\right)$$

$z = 0$

$x = -1$ $\qquad$ $y = 1$

$a + b + c = 0 + 1 - 1 = 0$

Letra C.

4. $\begin{cases} x + 2y - 3z = 29 \\ x + 3y + 2z = 4 \\ x - y - 2z = 8 \end{cases}$

$$\begin{pmatrix} 1 & 2 & -3 & | & 29 \\ 1 & 3 & 2 & | & 4 \\ 1 & -1 & -2 & | & 8 \end{pmatrix} \sim \begin{pmatrix} 0 & 1 & 5 & | & -25 \\ 0 & -3 & 1 & | & -21 \end{pmatrix} \sim \begin{pmatrix} & & & | & \\ 0 & 0 & 16 & | & -96 \end{pmatrix}$$

$16z = -96$

$z = \frac{-96}{16}$

$z = -6$

$y - 6 = -21$

$-3y = -15$

$y = 5$

$x - y - 2z = 8$

$x - 5 + 12 = 8$

$x = 13 - 12$

$x = 1$

$x + y + z = 1 + 5 - 6 = 0$

Letra A.

$-x+y+z=1+5-6=0$

Letra A.

5. $\begin{cases} 2x+y=5 \\ 2y+z=3 \\ 3x+2y+z=7 \end{cases}$

$$\left(\begin{array}{ccc|c} 2 & 1 & 0 & 5 \\ 0 & 2 & 1 & 3 \\ 3 & 2 & 1 & 7 \end{array}\right) \sim \left(\begin{array}{ccc|c} -4 & 0 & 1 & -7 \\ -1 & 0 & 1 & -3 \end{array}\right) \sim \left(\begin{array}{ccc|c} -3 & 0 & 0 & -4 \end{array}\right)$$

$-3x=-4 \cdot (-1)$

$x=\frac{4}{3}$

$2y+z=3$

$\frac{14}{3}+z=3$

$z=\frac{9}{3}-\frac{14}{3}$

$2x+y=5$

$\frac{8}{3}+y=5$

$y=\frac{15}{3}-\frac{8}{3}$

$z=\frac{-5}{3}$ $\quad y=\frac{7}{3}$

1º → $x = \frac{4}{3}$

2º → $y = \frac{7}{3}$

3º → $z = -\frac{5}{3}$

Letra D.

6. $\begin{bmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -1 & 2 & 2 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 3 \\ 7 \\ -1 \end{bmatrix}$

$x = 3$

$2x + y = 7 \Rightarrow 6 + y = 7 \Rightarrow y = 1$

$-x + 2y + 2z = -1 \Rightarrow -3 + 2 + 2z = -1$

$2z = 0 \Rightarrow z = 0$

A. Falso → $x \neq 1$

B. Falso → $y \neq 2$

C. Falso → $x = 3$ e $y \neq 4$

D. Falso → $y = 1$ e $z \neq 1$

E. Verdadeiro → $z = 0$

Letra E.