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TAREFA BÁSICA

01. Resolva os Sistemas pela Regra de Cramer:

a) $\begin{cases} 2x - y = 2 \\ -x + 3y = -3 \end{cases}$ $D = \begin{vmatrix} 2 & -1 \\ -1 & 3 \end{vmatrix} = 6 - 1 = 5$

$D_x = \begin{vmatrix} 2 & -1 \\ -3 & 3 \end{vmatrix} = 6 - 3 = \boxed{\frac{3}{5}}$

$D_y = \begin{vmatrix} 2 & 2 \\ -1 & -3 \end{vmatrix} = -6 - (-2) = -6 + 2 = \boxed{\frac{-4}{5}}$

$V = \left\{ \left(\frac{3}{5}, \frac{-4}{5} \right) \right\}$.

b) $\begin{cases} 3x - y + z = 1 \\ 2x + 3z = -1 \\ 4x + y - 2z = 7 \end{cases}$ $D = \begin{vmatrix} 3 & -1 & 1 \\ 2 & 0 & 3 \\ 4 & 1 & -2 \end{vmatrix} \begin{matrix} 3 & -1 \\ 2 & 0 \\ 4 & 1 \end{matrix} = -10 - 13 = -23$

0+9+4=13

0-12+2=-10

$D_x = \begin{vmatrix} 1 & -1 & 1 \\ -1 & 0 & 3 \\ 7 & 1 & -2 \end{vmatrix} \begin{matrix} 1 & -1 \\ -1 & 0 \\ 7 & 1 \end{matrix} = -22 - 1 = \frac{-23}{-23} = 1$ $\boxed{x = 1}$

0+3-2=1

0-21-1=-22

-4+63-4=55

$D_y = \begin{vmatrix} 3 & 1 & 1 \\ 2 & -1 & 3 \\ 4 & 7 & -2 \end{vmatrix} \begin{matrix} 3 & 1 \\ 2 & -1 \\ 4 & 7 \end{matrix} = 32 - 55 = \frac{-23}{-23} = 1$ $\boxed{y = 1}$

6+12+14=

$D_z = \begin{vmatrix} 3 & -1 & 1 \\ 2 & 0 & -1 \\ 4 & 1 & 7 \end{vmatrix} \begin{matrix} 3 & -1 \\ 2 & 0 \\ 4 & 1 \end{matrix} = 6 - (-17) = 6 + 17 = \frac{23}{-23} = -1$ $\boxed{z = -1}$

0-3-14=-17

0+4+2=6

$V = \{(1, 1, -1)\}$

02. (FGV)

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

$$\begin{array}{r} 3x+4y-z=1 \\ x-2y+3z=8 \quad + \\ \hline 4x+2y+2z=9 \end{array}$$

$\cdot(-1) = -4x-5y-2z=-12$

$$\begin{array}{r} -4x-5y-2z=-12 \\ 4x+2y+2z=9 \\ \hline -3y=-3 \end{array}$$

$$y=\frac{-3}{-3}=\boxed{y=1}$$

R: (A) 1.

03. (PUCSP) SE (a,b,c) É A SOLUÇÃO DO SISTEMA

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

$x+2y+z=1 \cdot(-3) \Rightarrow -3x-6y-3z=-3$ +

$3x+y-11z=-2$

$-5y-14z=-5$

$-5y-14z=-5$

$x+2y+z=1 \cdot(-2) \Rightarrow -2x-4y-2z=-2$

$2x+3y-z=1$

$-y-3z=-1$

(a) $-5y-14z=-5$

(b) $-y-3z=-1 \cdot(-5) \Rightarrow 5y+15z=5$

$-5y-14z=-5$ +

$5y+15z=5$

$z=0$ //

$-y-3.0=-1$

$-1y=-1$

$y=\frac{-1}{-1}$

$y=1$ //

$x+2y+z=1$

$x+2.1+0=1$

$x+2=1$

$x=1-2$

$x=-1$ //

$A+B+C$

$(-1)+1+0=0$ // R: (c) 0.

04 (UFRRJ) A Soma dos Números $(x+y+z)$, que satisfazem ao Sistema é

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

$$\begin{pmatrix} 1 & 2 & -3 & : & 29 \\ 1 & 2 & 2 & : & 4 \\ 1 & -1 & -2 & : & 8 \end{pmatrix} \sim \begin{pmatrix} 0 & 3 & -1 & : & 21 \\ 0 & 3 & 4 & : & -4 \end{pmatrix} \cdot 4$$

$$\sim \begin{pmatrix} 0 & 12 & -4 & : & 84 \\ 0 & 3 & 4 & : & -4 \end{pmatrix} \oplus$$

$$15y = 80$$

$$y = \frac{80}{15}$$

$$\boxed{y = 5}$$

$$3y - 1z = 21$$

$$3.5 - 1z = 21$$

$$15 - 1z = 21$$

$$-1z = 21 - 15$$

$$z = \frac{6}{-1}$$

$$\boxed{z = -6}$$

$$x + 2y - 3z = 29$$

$$x + 2.5 - 3.(-6) = 29$$

$$x + 10 + 18 = 29$$

$$x = 29 - 28$$

$$\boxed{x = 1}$$

$$x + y + z$$

$$\underbrace{1+5}+(-6)$$

$$6 - 6 = 0$$

R: Alternativa (A) 0.

05. Os valores de x, y e z nesta ordem, tais que são:

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

$$D = \begin{vmatrix} 2 & 1 & 0 \\ 0 & 2 & 1 \\ 3 & 2 & 1 \end{vmatrix} \begin{matrix} 2 & 1 \\ 0 & 2 \\ 3 & 2 \end{matrix}$$

0+4+0=4

4+3+0=7

$$D = 7 - 4 = 3$$

$$D_x = \begin{vmatrix} 5 & 1 & 0 \\ 3 & 2 & 1 \\ 7 & 2 & 1 \end{vmatrix} \begin{matrix} 5 & 1 \\ 3 & 2 \\ 7 & 2 \end{matrix}$$

0+10+3=13

10+7+0=17

$$D_x = 17 - 13 = \frac{4}{3}$$

$$D_y = \begin{vmatrix} 2 & 5 & 0 \\ 0 & 3 & 1 \\ 3 & 7 & 1 \end{vmatrix} \begin{matrix} 2 & 5 \\ 0 & 3 \\ 3 & 7 \end{matrix}$$

0+14+0=14

6+15+0=21

$$D_y = 21 - 14 = \frac{7}{3}$$

$$D_z = \begin{vmatrix} 2 & 1 & 5 \\ 0 & 2 & 3 \\ 3 & 2 & 7 \end{vmatrix} \begin{matrix} 2 & 1 \\ 0 & 2 \\ 3 & 2 \end{matrix}$$

30+12+0=42

28+9+0=37

$$D_z = 37 - 42 = \frac{-5}{3}$$

$$V = \left\{ \left(\frac{4}{3}, \frac{7}{3} \text{ e } \frac{-5}{3} \right) \right\}$$ Letra D.

06. (UEL) Um Sistema de Equações Lineares, com Incógnitas X, Y e Z, Foi Representado na Forma Matricial da Seguinte Maneira:

$$\begin{bmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -1 & 2 & 2 \end{bmatrix} \cdot \begin{bmatrix} X \\ Y \\ Z \end{bmatrix} = \begin{bmatrix} 3 \\ 7 \\ -1 \end{bmatrix} \qquad D = \begin{vmatrix} 1x & 0y & 0z \\ 2x & 1y & 0z \\ -1x & 2y & 2z \end{vmatrix} = \begin{vmatrix} 3 \\ 7 \\ -1 \end{vmatrix}$$

$$D = \begin{vmatrix} 1 & 0 & 0 & | & 1 & 0 \\ 2 & 1 & 0 & | & 2 & 1 \\ -1 & 2 & 2 & | & -1 & 2 \end{vmatrix} \quad \begin{matrix} 0+0+0=0 \\ 2+0+0=2 \end{matrix} \quad = 2-0 = 2$$

$$D_x = \begin{vmatrix} 3 & 0 & 0 & | & 3 & 0 \\ 7 & 1 & 0 & | & 7 & 1 \\ -1 & 2 & 2 & | & -1 & 2 \end{vmatrix} \quad \begin{matrix} 6+0+0=6 \\ 0+0+12=12 \end{matrix} \quad = 6-0 = \frac{6}{2} = 3 \quad \boxed{X=3}$$

$$D_y = \begin{vmatrix} 1 & 3 & 0 & | & 1 & 3 \\ 2 & 7 & 0 & | & 2 & 7 \\ -1 & -1 & 2 & | & -1 & -1 \end{vmatrix} \quad \begin{matrix} 14+0+0=14 \\ -3+14+0=11 \end{matrix} \quad = 14-12 = \frac{2}{2} = 1 \quad \boxed{Y=1}$$

$$D_z = \begin{vmatrix} 1 & 0 & 3 & | & 1 & 0 \\ 2 & 1 & 7 & | & 2 & 1 \\ -1 & 2 & -1 & | & -1 & 2 \end{vmatrix} \quad \begin{matrix} -1+0+12=11 \end{matrix} \quad = 11-11 = \frac{0}{2} = 0 \quad \boxed{Z=0}$$

R: É Verdadeiro que (E) $Z=0$.

$V = \{(3, 1 \text{ e } 0)\}$.

Tarefa Básica 2.

01. (UFG) Considere o Sistema

$$S=\begin{cases}2x-y-3z=-5\\ x+3y-z=11\\ x-5z=3\end{cases}$$

$$D=\begin{vmatrix}2 & -1 & -3\\ 1 & 3 & -1\\ 1 & 0 & -5\end{vmatrix}\begin{matrix}2 & -1\\ 1 & 3\\ 1 & 0\end{matrix}$$

$-9+0+5=-4$

$-30+1+0=-29$

$D=-29-(-4)=-25$ //

$$D_x=\begin{vmatrix}-5 & -1 & -3\\ 11 & 3 & -1\\ 3 & 0 & -5\end{vmatrix}\begin{matrix}-5 & -1\\ 11 & 3\\ 3 & 0\end{matrix}$$

$-27+0+55=28$

$75+3+0=78$

$D_x=78-28=\frac{50}{-25}=-2$ //

$\boxed{X=-2}$

$$D_y=\begin{vmatrix}2 & -5 & -3\\ 1 & 11 & -1\\ 1 & 3 & -5\end{vmatrix}\begin{matrix}2 & -5\\ 1 & 11\\ 1 & 3\end{matrix}$$

$-110+5-9=-114$

$-33-6+25=-14$

$D_y=-114-(-14)=-114+14=\frac{-100}{-25}=4$ //

$\boxed{Y=4}$

$$D_z=\begin{vmatrix}2 & -1 & -5\\ 1 & 3 & 11\\ 1 & 0 & 3\end{vmatrix}\begin{matrix}2 & -1\\ 1 & 3\\ 1 & 0\end{matrix}$$

$18-11+0=7$

$-15+0-3=-18$

$D_z=7-(-18)=7+18=\frac{25}{-25}=-1$ //

$\boxed{Z=-1}$

$V=\{(-2,4 \text{ e } -1)\}$ //

02. (CESGRANRIO) Resolvendo o Sistema

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

$$D = \begin{vmatrix} 1 & -2 & 0 \\ 0 & 2 & -3 \\ 1 & 1 & 1 \end{vmatrix} \begin{matrix} 1 & -2 \\ 0 & 2 \\ 1 & 1 \end{matrix} \quad \begin{matrix} 0-3+0=-3 \\ 2+6+0=8 \end{matrix}$$

$$D = 8-(-3) = 8+3 = 11 //$$

$x + 2y + 3z$ Vale: $0+0+0=0$

$$D_x = \begin{vmatrix} 0 & -2 & 0 \\ 0 & 2 & -3 \\ 11 & 1 & 1 \end{vmatrix} \begin{matrix} 0 & -2 \\ 0 & 2 \\ 11 & 1 \end{matrix} \quad 0+66+0=66$$

$$D_x = 66-0 = \frac{66}{11} = 6 // \quad \boxed{x=6}$$

$$D_y = \begin{vmatrix} 1 & 0 & 0 \\ 0 & 0 & -3 \\ 1 & 11 & 1 \end{vmatrix} \begin{matrix} 1 & 0 \\ 0 & 0 \\ 1 & 11 \end{matrix} \quad \begin{matrix} 0-33+0=-33 \\ 0+0+0=0 \end{matrix}$$

$$D_y = 0-(-33) = 0+33 = \frac{33}{11} = 3 // \quad \boxed{y=3}$$

$$D_z = \begin{vmatrix} 1 & -2 & 0 \\ 0 & 2 & 0 \\ 1 & 1 & 11 \end{vmatrix} \begin{matrix} 1 & -2 \\ 0 & 2 \\ 1 & 1 \end{matrix} \quad \begin{matrix} 0+0+0 \\ 22+0+0=22 \end{matrix}$$

$$D_z = 22-0 = \frac{22}{11} = 2 // \quad \boxed{z=2}$$

$x + 2y + 3z =$ R: Alternativa (B) 18.

$6 + 2.3 + 3.2$

$6+6+6 = 18 //$

03. (FGV) Resolvendo o sistema abaixo, obtém-se para z o valor:

$$\begin{cases} x+y+z=0 \\ 2x-y-2z=1 \\ 6y+3z=-12 \end{cases} \xrightarrow{-2} \left(\begin{array}{ccc|c} 1 & 1 & 1 & 0 \\ 2 & -1 & -2 & 1 \\ 0 & 6 & 3 & -12 \end{array}\right) \sim \left(\begin{array}{ccc|c} 0 & -3 & -4 & 1 \\ 0 & 6 & 3 & -12 \end{array}\right)$$

$$\sim(-2) = \left(\begin{array}{ccc|c} 0 & -3 & -4 & 1 \\ 0 & 6 & 3 & -12 \end{array}\right) \sim \left(\begin{array}{ccc|c} 0 & -6 & -8 & 2 \\ 0 & 6 & 3 & -12 \end{array}\right)$$

$$-5z = -10$$

$$z = \frac{-10}{-5}$$

$$\boxed{z = 2}$$ R: Letra (D) 2.

04. (UEL) Ali, Bia e Caco tem juntos R$ 68,00.

$$\begin{cases} A+B+C=68 \\ B+0,2C=A \\ C+0,2A=3B \end{cases} = \left(\begin{array}{ccc|c} 1 & 1 & 1 & 68 \\ -1 & 1 & 0,2 & 0 \\ 0,2 & -3 & 1 & 0 \end{array}\right) \xrightarrow{+} \sim \left(\begin{array}{ccc|c} 1 & 1 & 1 & 68 \\ -1 & 1 & 0,2 & 0 \end{array}\right)$$

$$C+0,2A=3(34-0,6C)$$

$$C+0,2A=102-1,8C$$

$$2,8C+0,2A=102$$

$$2,8C+0,2(B+0,2C)=102$$

$$2,8C+0,2B+0,04C=102$$

$$2,84C+0,2B=102$$

$$2,84C+0,2(34-0,6C)=102$$

$$2,72C=102-6,8$$

$$2,72C=95,2 \quad C=\frac{95,2}{2,72}=35$$

Caco tem R$ 35,00.

$$a+b+c=68$$

$$a+13+35=68$$

$$a=68-48$$

$$a=20$$

Ali R$ 20,00

$$2b+1,2c=68$$

$$2b+1,2 \cdot 35=68$$

$$2b=26$$

$$b=13$$ Bia R$ 13,00

R: (A) Ali tem R$ 15,00 a menos que Caco.

05. (PUCSP)

$$A=\begin{bmatrix}0&3&4\\1&0&5\\2&1&0\end{bmatrix} \quad X=\begin{bmatrix}X\\Y\\Z\end{bmatrix}=134,00 \quad =115,00 \quad =48,00$$

$$D=\begin{vmatrix}0&3&4&0&3\\1&0&5&1&0\\2&1&0&2&1\end{vmatrix}=340=34$$

0+0+0=0

0+30+4=34

$$D_x=\begin{vmatrix}134&3&4&134&3\\115&0&5&115&0\\48&1&0&48&1\end{vmatrix}=1180-670=\frac{510}{34}=15$$

0+670+0=670

0+720+460=1180

$X=15$

$$D_y=\begin{vmatrix}0&134&4&0&134\\1&115&5&1&115\\2&48&0&2&48\end{vmatrix}=1532-920=\frac{612}{34}=18$$

920+0+0=920

0+1340+192=1532

$Y=18$

$$D_z=\begin{vmatrix}0&3&134&0&3\\1&0&115&1&0\\2&1&48&2&1\end{vmatrix}=824-144=\frac{680}{34}=20$$

0+0+144=144

0+690+134=824

$Z=20$

$X+Y+Z$

$15+18+20=53$

R: Letra (A) R$ 53,00.