nome: Matheus HENRique Cfli317

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

$D = \begin{vmatrix} 2 & -1 \\ -1 & 3 \end{vmatrix} = 6 - 1 = 5$

$Dx = \begin{vmatrix} 2 & -1 \\ -3 & 3 \end{vmatrix} = 6 - 3 = 3$

$\begin{cases} x = \frac{Dx}{D} = \frac{3}{5} \end{cases}$

$Dy = \begin{vmatrix} 2 & 2 \\ -1 & -3 \end{vmatrix} = -6 - (-2) = -4$

$\begin{cases} y = \frac{Dy}{D} = \frac{-4}{5} \end{cases}$

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

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

$D = \begin{vmatrix} 3 & -1 & 1 & 3 & -1 \\ 2 & 0 & 3 & 2 & 0 \\ 4 & 1 & -2 & 4 & 1 \end{vmatrix}$

$0 + 9 + 4 = 13$

$0 - 12 + 2 = -10$

$D = -10 - 13 = -23$

$Dx = \begin{vmatrix} 1 & -1 & 1 & 1 & -1 \\ -1 & 0 & 3 & -1 & 0 \\ 7 & 1 & -2 & 7 & 1 \end{vmatrix}$

$0 + 3 - 2 = 1$

$0 - 21 - 1 = -22$

$\rightarrow Dx - 22 - 1 = -23x$

$\begin{cases} x = \frac{Dx}{D} \\ x = \frac{-23}{-23} = 1 \end{cases}$

$y = \frac{Dy}{D} = \frac{-23}{-23} = 1$

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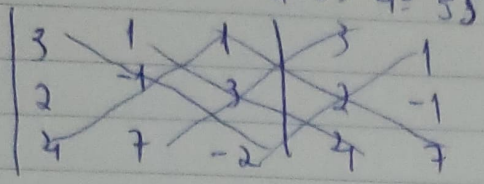
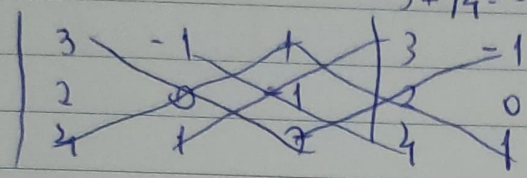
$D_y =$ 

$-4+63-4 = 55$

$6+12+14 = 32$

$\rightarrow D_y = 32 - 55 = -23$

$D_2 =$ 

$0+3+14 = -17$

$0+4+2 = 6$

$\therefore d_2 = 6-(-17) = 23$

$$z = \frac{D_2}{D} = \frac{23}{-23} = -1$$

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

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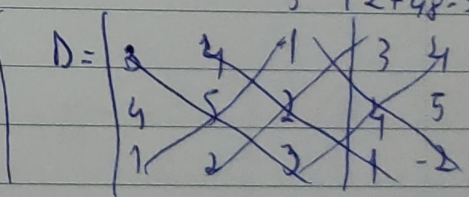
2) $y = ?$

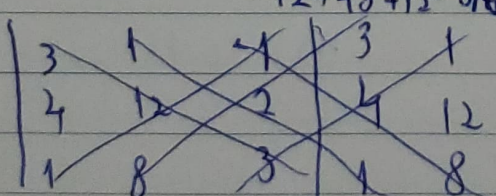
$$\begin{cases} 3x + 4y - 2 = 1 \\ 4x + 5y - 22 = 12 \\ x - 2y + 32 = 8 \end{cases}$$

$D =$ 

$-5 - 12 + 48 = 31$

$45 + 8 + 8 = 61$

$D = 61 - 31 = 30$

$D_y =$ 

$-12+48+12 = 48$

$108 + 2 - 32 = 78$

$\rightarrow d_y = 78 - 48 = 30$

$$y = \frac{D_y}{D} = \frac{30}{30} = 1$$

Alternativa (A)

③ $A+B+C = ?$

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

$2 - 33 - 6 = 37$

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

$-1 - 44 + 9 = -36$

$D = -36 - (-37) = 1$

$1 - 33 + 4 = 28$

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

$-1 - 22 - 6 = -29$

$\rightarrow D_x = -29 - (-28) = -1$

$x = \frac{D_x}{D} = \frac{-1}{1} = -1$ (a)

$-4 - 11 - 3 = -18$

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

$2 - 22 + 3 = -17$

$\rightarrow D_y = -17 - (-18) = 1$

$y = \frac{D_y}{D} = \frac{1}{1} = \boxed{1}$ (B)

$2 - 6 + 6 = 2$

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

$1 - 8 + 9 = 2$

$\rightarrow D_z = 2 - 2 = 0$

$z = \frac{D_z}{D} = \frac{0}{1} = 0$ (c)

$a + B + C = -1 + 1 + 0 = \boxed{0}$ Alternativa (c)

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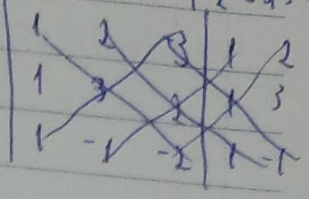
④ $x+y+z=?$

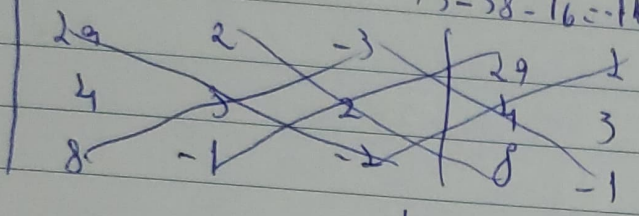
$$\begin{cases} x+2y-3z=29 \\ x+3y+2z=4 \\ x-y-2z=8 \end{cases}$$

$D=$



$D=1\cdot(-15)=16$

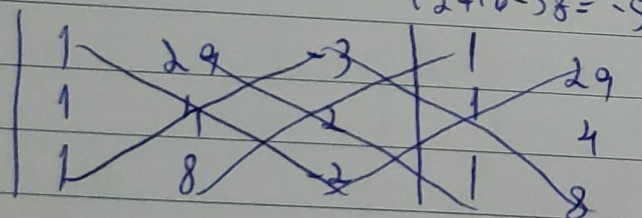
$D_x=$



$D_x=-130-(-146)=16$

$x=\frac{D_x}{D}=\frac{16}{16}=\boxed{1}$

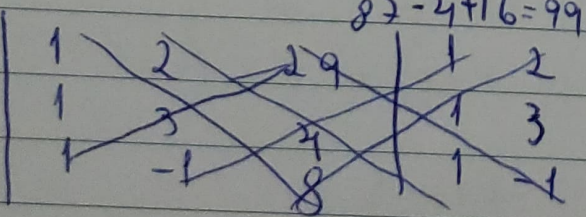
$D_y=$



$\hookrightarrow D_y=26\,(-54)=80$

$y=\frac{D_y}{D}=\frac{80}{16}=5$

$D_2=$



$D_2=3-99=-96$

$z=\frac{D_2}{D}=\frac{-96}{16}=\boxed{-6}$

$x+y+z=1+5-6=\boxed{0}$ → Alternativa A

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/ / / /

⑤ x, y, z

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

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

$0+4+0=4$

$4+3+0=7$

$D = 10+3 = 13$

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

$10+7+0=17$

$D_x = 17-13 = 4$

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

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

$0+14+0=14$

$6+15+0=21$

$D_y = 21-14 = 7$

$$y = \frac{D_y}{D} = \frac{7}{3}$$

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

$30+12+0=42$

$28+9+0=37$

$D_z = 37-42 = -5$

$$z = \frac{D_z}{D} = \frac{-5}{3}$$

$$V = \left\{ \left(\frac{4}{3}, \frac{7}{3}, \frac{-5}{3} \right) \right\}$$ Alternativa (d)

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

$\begin{bmatrix} (x+0+0) \\ (2x+y+0) \\ (-x+2y+2z) \end{bmatrix} = \begin{bmatrix} 3 \\ 7 \\ -1 \end{bmatrix}$

$2x+y=7$
$2 \cdot 3+y=7$
$6+y=7$
$y=7-6=1$

$-x+2y+2z=-1$
$-3+2 \cdot 1+2z=-1$
$2z=-1-2+3$
$2z=0$
$z=\frac{0}{2}=0$

Alternativa E

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TAREFA BÁSICA - Escalonamento

① $S = \begin{cases} 2x - y - 3z = 5 \\ x + 3y - z = 11 \\ x - 5z = 3 \end{cases}$

$-2z = -25$

$z = \frac{-25}{25} = 1$

$\xrightarrow{3} \left(\begin{array}{ccc|c} 2 & -1 & -3 & -5 \\ 1 & 3 & -1 & 11 \\ 1 & 0 & -5 & 3 \end{array}\right)$ ④ $\left(\begin{array}{ccc|c} \cdot & & & \\ 7 & 0 & -10 & -4 \\ 1 & 0 & -5 & 3 \end{array}\right) \sim \left(\begin{array}{ccc|c} & & & \\ & & & \\ 0 & 0 & 25 & \end{array}\right)$ (-7)

$7x + 10z = -4 \rightsquigarrow 7x - 10 \cdot (-1) = -4$

$7x + 10 = -4$

$7x = -4 - 10$

$7x = -14$

$x = \frac{-14}{7} = -2$

$\begin{cases} x + 3x - z = 11 \\ -2 + 3y - (-1) = 11 \\ 3y = 11 + 2 - 1 \\ 3y = 12 \\ y = \frac{12}{3} = \boxed{4} \end{cases}$

② $x + 2y + 3z ?$

$\begin{cases} x - 2y = 0 \\ 2y - 3z = 0 \\ x + y + z = 11 \end{cases}$ $-1 \left(\begin{array}{ccc|c} 1 & -2 & 0 & 0 \\ 0 & 2 & -3 & 0 \\ 1 & 1 & 1 & 11 \end{array}\right) \sim$

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$$\sim \left(\begin{array}{ccc|c} & & & \\ 4 & 0 & 2 & -3 & 0 \\ 13 & 0 & 3 & 1 & 11 \end{array}\right) \sim \left(\begin{array}{ccc|c} & & & \\ & & & \\ 0 & 11 & 0 & 33 \end{array}\right)$$

$$\begin{cases} 11y = 33 \end{cases}$$

$$y = \frac{33}{11} = 3$$

$$2y - 3z = 0$$
$$1 \cdot 3 = 3z$$
$$z = \frac{6}{3} = 2$$

$$x - 2y = 0$$
$$x - 2 \cdot 3 = 0$$
$$x = 6$$

$$\begin{cases} x + 2y + 3z = ? \\ 6 + 2 \cdot 3 + 3 \cdot 2 \\ 6 + 6 + 6 = 18 \end{cases}$$ Alternativa B

③ 23

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

$$\sim \left(\begin{array}{ccc|c} & & & \\ & & & \\ 0 & -3 & -4 & 1 \\ 0 & 6 & 3 & -12 \end{array}\right) \sim \left(\begin{array}{ccc|c} & & & \\ & & & \\ 0 & 0 & -5 & -10 \end{array}\right)$$ ④ (2)

$$-5z = -10$$
$$z = \frac{-10}{-5} = 2$$ Alternativa D

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*

(4) A = Ali, B = Bio, C = Caco

$$\begin{cases} A+B+C=68 \\ B+\frac{20}{100}C=A \\ C+\frac{20}{100}A=3B \end{cases} \Rightarrow \begin{cases} A+B+C=68 \\ A-B-\frac{1}{5}C=0 \\ \frac{1}{5}A-3B+C=0 \end{cases} \Rightarrow \begin{pmatrix} 1 & 1 & 1 & \vdots & 68 \\ 1 & -1 & -\frac{1}{5} & \vdots & 0 \\ \frac{1}{5} & -3 & 1 & \vdots & 0 \end{pmatrix}$$

$$\sim \begin{pmatrix} 1 & 1 & 1 & \vdots & 68 \\ 0 & -2 & -\frac{6}{5} & \vdots & -68 \\ 0 & -\frac{16}{5} & \frac{4}{5} & \vdots & -\frac{68}{5} \end{pmatrix} \sim \left(-\frac{8}{5}\right) (+) \begin{pmatrix} 0 & -2 & -\frac{6}{5} & \vdots & -68 \\ 0 & -\frac{16}{5} & \frac{4}{5} & \vdots & -\frac{68}{5} \end{pmatrix}$$

$$\begin{pmatrix} & & & \vdots & \\ 0 & 0 & \frac{68}{25} & \vdots & \frac{476}{5} \end{pmatrix} \Rightarrow \frac{68}{25}C = \frac{476}{5}$$

$$\Rightarrow C = \frac{476}{5} \cdot \frac{25}{68} = 35$$

$$-2B - \frac{6}{5}C = -68$$

$$-2B = \frac{6}{5} \cdot 35 = -68$$

$$-2B = -68+42$$

$$B = \frac{-26}{-2} = 13$$

$$A+B+C=68 \Rightarrow A = 68-13-35$$

$$A+13+35=68 \qquad A=20$$

Ali = R\$ 20,00

Bio = R\$ 13,00

Caco = R\$ 35,00

Alternativa (A)

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⑤ Alfeu = R$ 134,00
Bento = R$ 115,00
Cintia = 48,00 R$

$A = \begin{pmatrix} \text{quantidade} \\ \text{camisetas} \end{pmatrix} = \begin{bmatrix} 0 & 3 & 4 \\ 1 & 0 & 5 \\ 2 & 1 & 0 \end{bmatrix}$

$X \begin{pmatrix} \text{Preços unitários} \\ \text{camisetas} \end{pmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix}$, $x+y+z = ?$

* Compras (multiplicar matrizes A e x)

Alfeu $3y+4z = 134$
Bento $x+5z = 115$
Cintia: $2x+1y = 48$

$$\begin{cases} 3y+4z = 134 \\ x+5z = 115 \\ 2x+1y = 48 \end{cases}$$

$$\left(\begin{array}{ccc|c} 0 & 3 & 4 & 134 \\ 1 & 0 & 5 & 115 \\ 2 & 1 & 0 & 48 \end{array}\right) \oplus \left(\begin{array}{ccc|c} -6 & 0 & 4 & -10 \\ 1 & 0 & 5 & 115 \end{array}\right) (6)$$

$$\left(\begin{array}{ccc|c} 0 & 0 & 34 & 680 \end{array}\right) \rightarrow 34z = 680$$

$$z = \frac{680}{34} = 20$$

$x + 5z = 115$
$x + 5 \cdot 20 = 115$
$x = 115 - 100$
$x = 15$

$2x + y = 48$
$2 \cdot 15 + y = 48$
$y = 48 - 30 = 18$

$x + y + z =$
$15 + 18 + 20 = \boxed{53}$

Alternativa A