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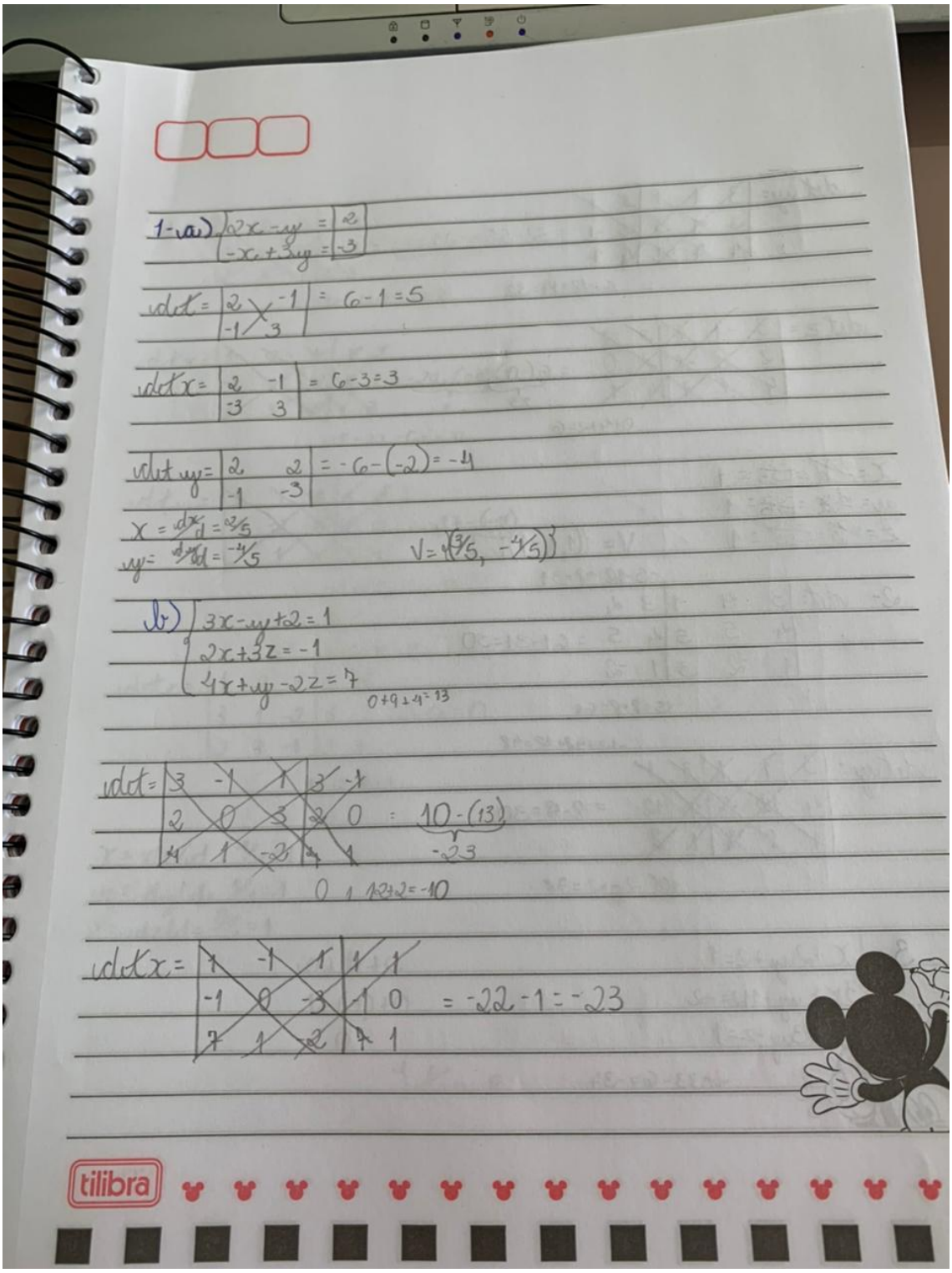
Turma: CTII 317

Tarefa Básica – Sistemas Lineares – Regra de Cramer – Escalonamento



$\det w_y = \begin{vmatrix} 3 & 1 & 1 \\ 2 & -1 & 3 \\ 4 & 7 & 2 \end{vmatrix} \begin{matrix} 3 & 1 \\ 2 & -1 \\ 4 & 7 \end{matrix} = 32 - 55 = -23$

$6 + 12 + 14 = 32$

$\det z = \begin{vmatrix} 3 & -1 & x \\ 2 & 0 & -x \\ 4 & 1 & 2 \end{vmatrix} \begin{matrix} 3 & -1 \\ 2 & 0 \\ 4 & 1 \end{matrix} = 6(-1) = -23$

$0 + 4 + 2 = 6$

$x = \frac{dx}{d} = \frac{-23}{-23} = 1$

$w_y = \frac{dw_y}{d} = \frac{-23}{-23} = 1$

$z = \frac{dz}{d} = \frac{-23}{-23} = 1$ $\quad V = \{(1, 1, -1)\}$

$-5 - 12 - 48 = -31$

2- $\det = \begin{vmatrix} 3 & 4 & -1 \\ 4 & 5 & 5 \\ 1 & -2 & 3 \end{vmatrix} \begin{matrix} 3 & 4 \\ 4 & 5 \\ 1 & -2 \end{matrix} = 61 - 31 = 30$

$15 + 8 + 8 = 61$

$-12 + 48 + 12 = 48$

$\det w_y = \begin{vmatrix} 3 & 1 & x \\ 4 & 12 & -2 \\ 1 & 8 & 2 \end{vmatrix} \begin{matrix} 3 & 1 \\ 4 & 12 \\ 1 & 8 \end{matrix} = 78 - 48 = 30$

$108 - 2 - 28 = 78$

3- $\begin{cases} x + 2w_y + 2 = 1 \\ 3x + w_y - 12 = -2 \\ 2x + 3w_y - z = 1 \end{cases}$

$2 + 33 - 6 = -37$

$$\det = \begin{vmatrix} 1 & 2 & 1 \\ 3 & 1 & -1 \\ 2 & 3 & -1 \end{vmatrix} \begin{matrix} 1 & 2 \\ 3 & 1 \\ 2 & 3 \end{matrix} = -37 - (-36) = -1$$

$$-1 + -4 + 4 + 9 = -36$$

$$\det x = \begin{vmatrix} 1 & 2 & 1 \\ -2 & 1 & -1 \\ 1 & 3 & -1 \end{vmatrix} \begin{matrix} 1 & 2 \\ -2 & 1 \\ 1 & 3 \end{matrix} = -29 - (-28) = -1$$

$$-1 - 22 - 6 = -29$$

$$\det y = \begin{vmatrix} 1 & 1 & 1 \\ 3 & -2 & -1 \\ 2 & 1 & -1 \end{vmatrix} \begin{matrix} 1 & 1 \\ 3 & -2 \\ 2 & 1 \end{matrix} = -17 - (-18) = 1$$

$$2 - 22 - 3 = -17$$

$$2 - 6 - 36 = 2$$

$$\det z = \begin{vmatrix} 1 & 2 & 1 \\ 3 & 1 & -2 \\ 2 & 3 & -1 \end{vmatrix} \begin{matrix} 1 & 2 \\ 3 & 1 \\ 2 & 3 \end{matrix} = 2 - 2 = 0$$

$$1 + -8 + 9 = 2$$

$x = dx/d = -1/1 = 1$

$y = dy/d = 1/1 = -1$

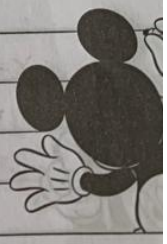
$z = dz/d = 0/-1 = 1$

$ax + by + c$

$1 + (-1) + 0$

0

Letra E



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

$-9-2-4=-15$

d =

1	2	-3	1	2
1	3	2	1	3
1	-1	-2	1	-1

$= \underbrace{13-(-15)}_{28}$

$6+4+3=13$

$-12-58-16=-146$

dx =

29	2	-3	29	2
4	3	2	4	3
8	-1	-2	8	-1

$= \underbrace{-130-(146)}_{16}$

$-174 \; 30 \; 12 = -130$

dy =

1	29	-3	1	29
1	4	2	1	4
1	8	-2	1	8

$= \underbrace{26-(-54)}_{80}$

$-8 \; 58 \; +24 = 26$

dz =

1	2	29	1	2
1	3	4	1	3
1	-1	8	1	-1

$= \underbrace{3-99}_{-96}$

$24 \; 8 \; -29 = 3$

$x = dx/d = 16/28 = 4/7 \simeq 0,57$

$y = dy/d = 80/28 = 20/7 \simeq 2,85$

$z = dz/d = -96/28 = -24/7 \simeq 3,42$

$(x+y+z)$

$0,57+2,85+(-3,42)$

$3,42-3,42$

0 Letra A

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

$idet = \begin{vmatrix} 2 & 1 & 0 \\ 0 & 2 & 1 \\ 3 & 2 & 1 \end{vmatrix}$ $\begin{matrix} 2 & 1 \\ 0 & 2 \\ 3 & 2 \end{matrix}$ $= 7-4 = 3$

$4+3+0=7$

$idetx = \begin{vmatrix} 5 & 1 & 0 \\ 3 & 2 & 1 \\ 4 & 2 & 1 \end{vmatrix}$ $\begin{matrix} 5 & 1 \\ 3 & 2 \\ 4 & 2 \end{matrix}$ $= 17-13 = 4$

$idetxy = \begin{vmatrix} 2 & 5 & 0 \\ 0 & 3 & 1 \\ 3 & 4 & 1 \end{vmatrix}$ $\begin{matrix} 2 & 5 \\ 0 & 3 \\ 3 & 4 \end{matrix}$ $= 21-14 = 7$

$idetz = \begin{vmatrix} 2 & 1 & 5 \\ 0 & 2 & 3 \\ 3 & 2 & 4 \end{vmatrix}$ $\begin{matrix} 2 & 1 \\ 0 & 2 \\ 3 & 2 \end{matrix}$ $= 37-42 = -5$

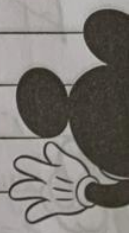
$x = idx/d = 4/3$

$y = idy/d = 7/3$

$z = idz/d = -5/3$

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

Letra D



tilibra

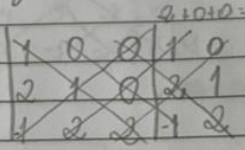
6-

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

$$\begin{vmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -1 & 2 & 2 \end{vmatrix} \cdot \begin{vmatrix} x \\ y \\ z \end{vmatrix} = \begin{vmatrix} x+0y+0z \\ 2x+y+0z \\ -x+2y+2z \end{vmatrix}$$

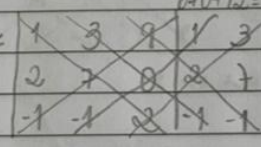
$$\begin{vmatrix} x+0y+0z \\ 2x+y+0z \\ -x+2y+2z \end{vmatrix} = \begin{vmatrix} 3 \\ 7 \\ -1 \end{vmatrix} \rightarrow \begin{cases} x=3 \\ 2x+y=7 \\ -x+2y+2z=-1 \end{cases}$$

$d = 1+0+0 = 2$

$d_x =$  $= 6$

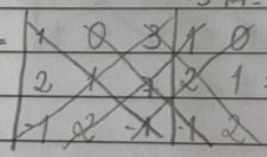
$6+0+0=6$

$0+0+12=12$

$d_y =$  $= 14-12=2$

$14+0+0=14$

$-3-11=11$

$d_z =$  $= 11-11=0$

$-1+0+12=11$

$x = d_x/d = 6/2 = 3$

$y = d_y/d = 2/2 = 1$

$z = d_z/d = 2/2 = 0$

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

Letra E