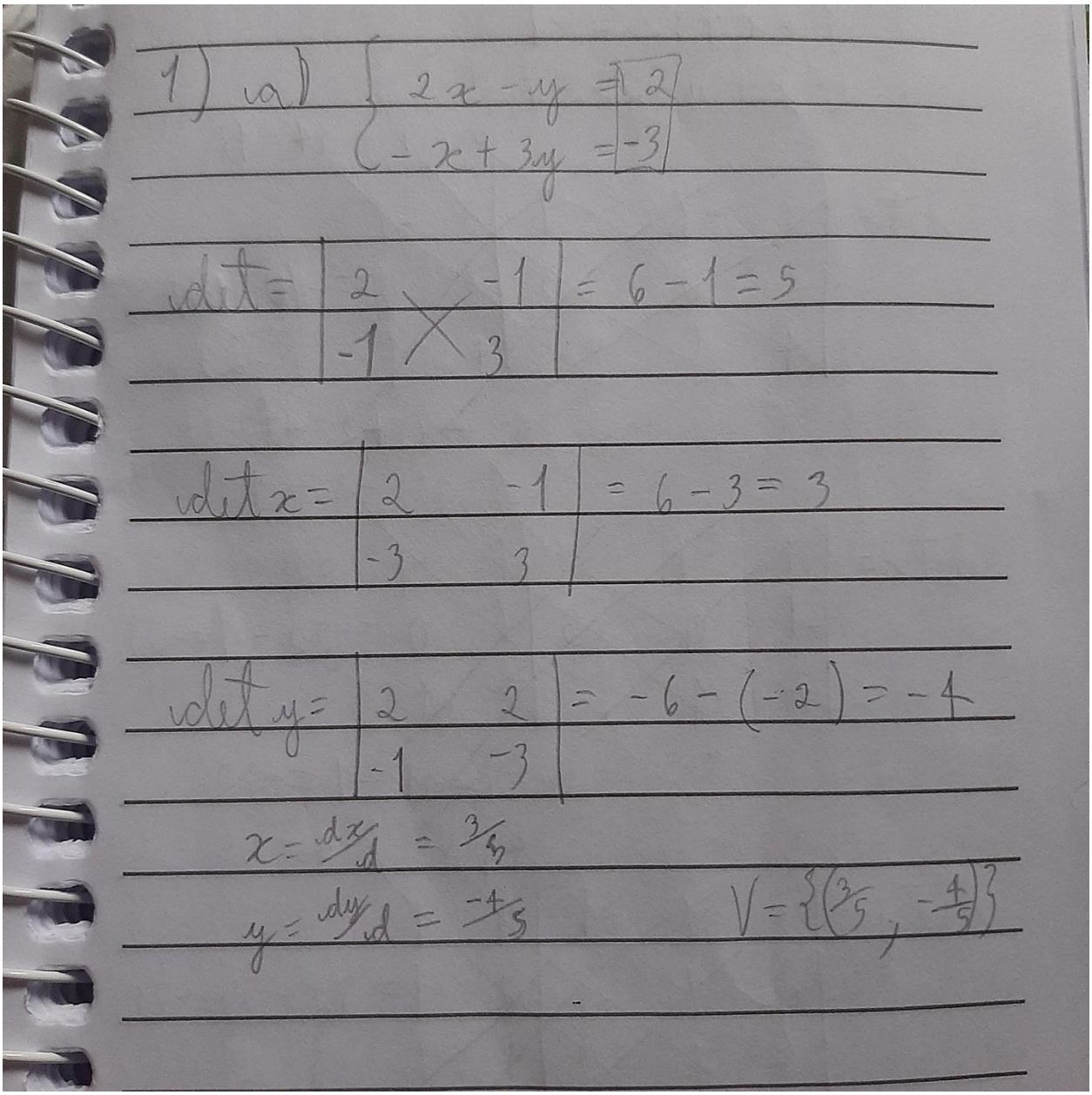
Nome: Victória Ferreira de Souza

Sala: CTII 317

Regra de Cramer



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

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

$0 + 9 + 4 = 13$

$0 + 12 + 2 = 14$

$0 = -10 - (13) =$

-23

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

$0 \quad 3 \quad -2 = 1$

$0 = -22 - 1 = -23$

$0 \quad -21 \quad -1 = -22$

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

$-4 \quad 63 \quad -4 = 55$

$-1 = 32 - 55 = -23$

$6 + 12 + 14 = 32$

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

$0 \quad -3 \quad -14 = -17$

$0 = 6 - (-17)$

23

$0 + 1 + 2 = 6$

$x = \frac{\det x}{\det} = \frac{-23}{-23} = 1$

$y = \frac{\det y}{\det} = \frac{-23}{-23} = 1$

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

2) $y = ?$

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

$-5 \quad -12 \quad 48 = 31$

$5 = 61 - 31 = 30$

$45 + 8 + 8 = 61$

$-12 + 48 + 12 = 48$

$\det y = \begin{vmatrix} 3 & 1 & -1 & 3 & 1 \\ 4 & 12 & 2 & 4 & 12 \\ 1 & 8 & 3 & 1 & 8 \end{vmatrix}$

$1 = 78 - 48 = 30$

$108 \quad 2 - 32 = 78$

$y = \frac{dy}{d} = \frac{30}{30} = 1$; letra A

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

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

$2 + -33 - 6 = -37$

$1 = -37 - (-36)$

-1

$-1 + -11 + 9 = -36$

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

$1 - 33 \quad 4 = -28$

$1 = -29 - (-28)$

-1

$-1 - 22 - 6 = -29$

$-4 \quad -11 \quad -3 = -18$

$$\det y = \begin{vmatrix} 1 & 1 & 1 & 1 & 1 \\ 3 & -2 & 11 & 3 & -2 \\ 2 & 1 & -1 & 2 & 1 \end{vmatrix}$$

$-17 - (-18)$

$2 \quad -22 \quad 3 = -17$

$2 \quad -6 \quad +6 = 2$

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

$1 = 2 - 2 = 0$

$-1 + -8 + 9 = 2$

$x = \frac{\det x}{\det} = \frac{-1}{-1} = 1$

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

$z = \frac{\det z}{\det} = \frac{0}{-1} = 0$

$ax + by + cz$

$1 + (-1) + 0$

0

letra E

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

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

$-9 \quad -2 \quad -4 = -15$

$6 + 4 + 3 = 13$

$3 = 13 - (-15) = 28$

$\det_x = \begin{vmatrix} 29 & 2 & -3 \\ 4 & 3 & 2 \\ 8 & -1 & -2 \end{vmatrix}$

$-72 \quad -58 \quad -16 = -146$

$-174 \quad 32 \quad 12 = -130$

$3 = -130 - (-146) = 16$

$\det_y = \begin{vmatrix} 1 & 29 & -3 \\ 1 & 4 & 2 \\ 1 & 8 & -2 \end{vmatrix}$

$-12 \quad 16 \quad -58 = -54$

$-8 \quad 58 \quad -24 = 26$

$29 = 26 - (-54) = 80$

$$\det z = \begin{vmatrix} 1 & 2 & 29 & 1 & 2 \\ 1 & 3 & 4 & 1 & 3 \\ 1 & -1 & 8 & 1 & -1 \end{vmatrix}$$

87 − 4 16 = 99

3 = 3 − 99

−96

24 8 −29 = 3

$$x = \frac{dx}{d} = \frac{16}{28} = \frac{4}{7} \simeq 0,57$$

$$y = \frac{dy}{d} = \frac{80}{28} = \frac{20}{7} \simeq 2,85$$

$$z = \frac{dz}{d} = \frac{-96}{28} = -\frac{24}{7} \simeq -3,42$$

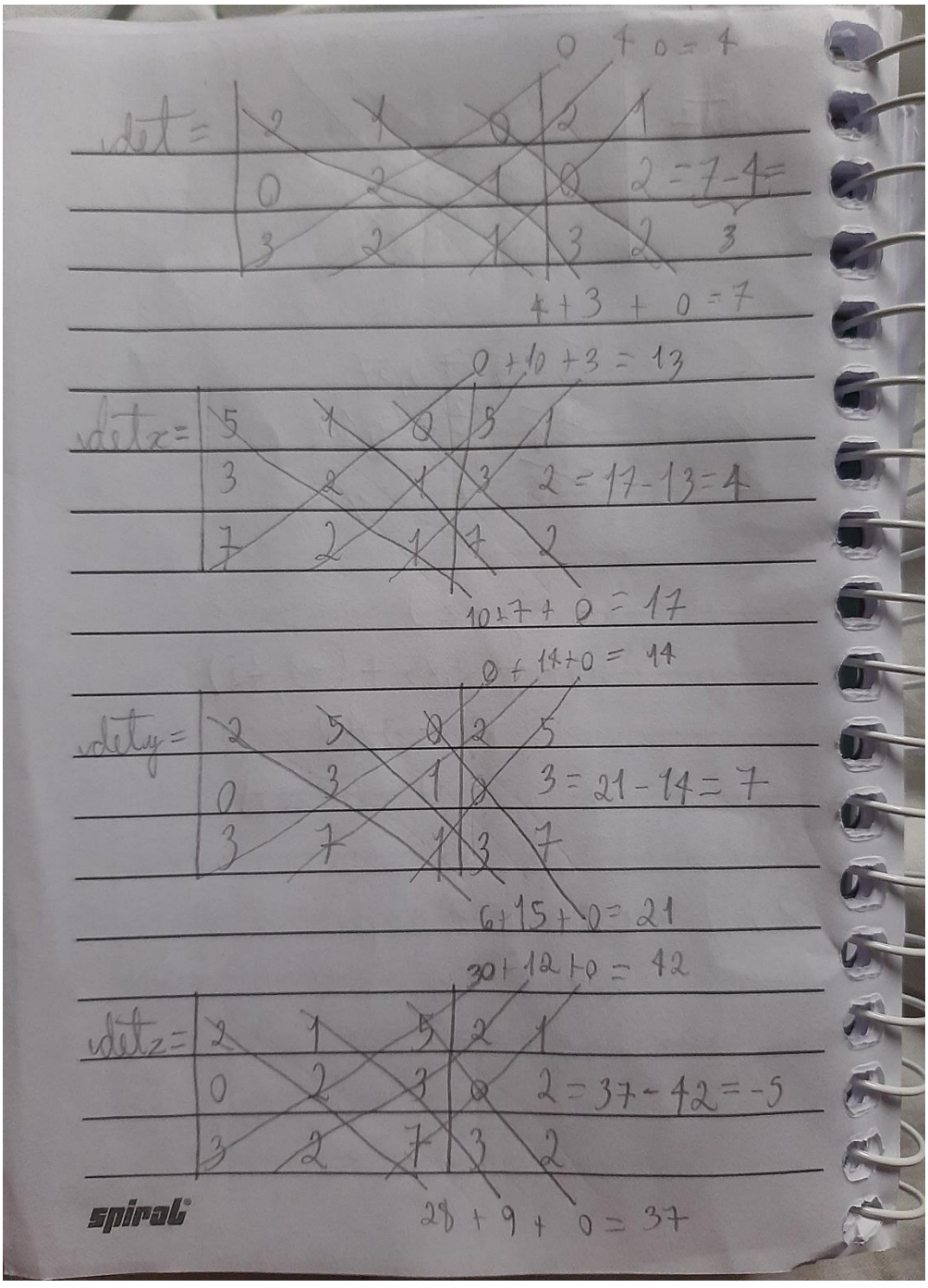
$x + y + z$

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

$3,42 - 3,42$

0 letra A

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


det =
2 1 0 2 1
0 2 1 0 2
3 2 1 3 2
0 + 0 + 4 = 4
4 + 3 + 0 = 7
2 = 7 - 4 =
detx =
5 1 0 5 1
3 2 1 3 2
7 2 1 7 2
0 + 10 + 3 = 13
10 + 7 + 0 = 17
2 = 17 - 13 = 4
dety =
2 5 0 2 5
0 3 1 0 3
3 7 1 3 7
0 + 14 + 0 = 14
6 + 15 + 0 = 21
3 = 21 - 14 = 7
detz =
2 1 5 2 1
0 2 3 0 2
3 2 7 3 2
30 + 12 + 0 = 42
28 + 9 + 0 = 37
2 = 37 - 42 = -5
spirol

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

$y = \frac{d_y}{d} = \frac{7}{3}$

$z = \frac{d_z}{d} = \frac{-5}{3}$ Letra D $V = \left\{\left(\frac{4}{3}, \frac{7}{3}, \frac{-5}{3}\right)\right\}$

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

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

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

$0+0+0=0$

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

$2+0+0=2$

$0\ 0\ 0$

$\det_x = \begin{vmatrix} 2 & 0 & 0 & 2 & 0 \\ 7 & 1 & 0 & 7 & 1 \\ -1 & 2 & 2 & -1 & 2 \end{vmatrix} = 6$

$6+0+0=6$

$0+0+12=12$

$\det_y = \begin{vmatrix} 1 & 3 & 0 & 1 & 3 \\ 2 & 7 & 0 & 2 & 7 \\ -1 & -1 & 2 & -1 & -1 \end{vmatrix} = -14+12=2$

$14+0+0=14$

$-3\ \ 14\ \ 0=11$

$\det_z = \begin{vmatrix} 1 & 0 & 1 & 1 & 0 \\ 2 & 1 & 7 & 2 & 1 \\ -1 & 2 & -1 & -1 & 2 \end{vmatrix} = 11-11=0$

$-1+0+12=11$

$x = \frac{dx}{d} = \frac{6}{2} = 3$ $V = \{(3, 1, 0)\}$

$y = \frac{dy}{d} = \frac{2}{2} = 1$

$z = \frac{dz}{d} = \frac{0}{2} = 0$ letra E