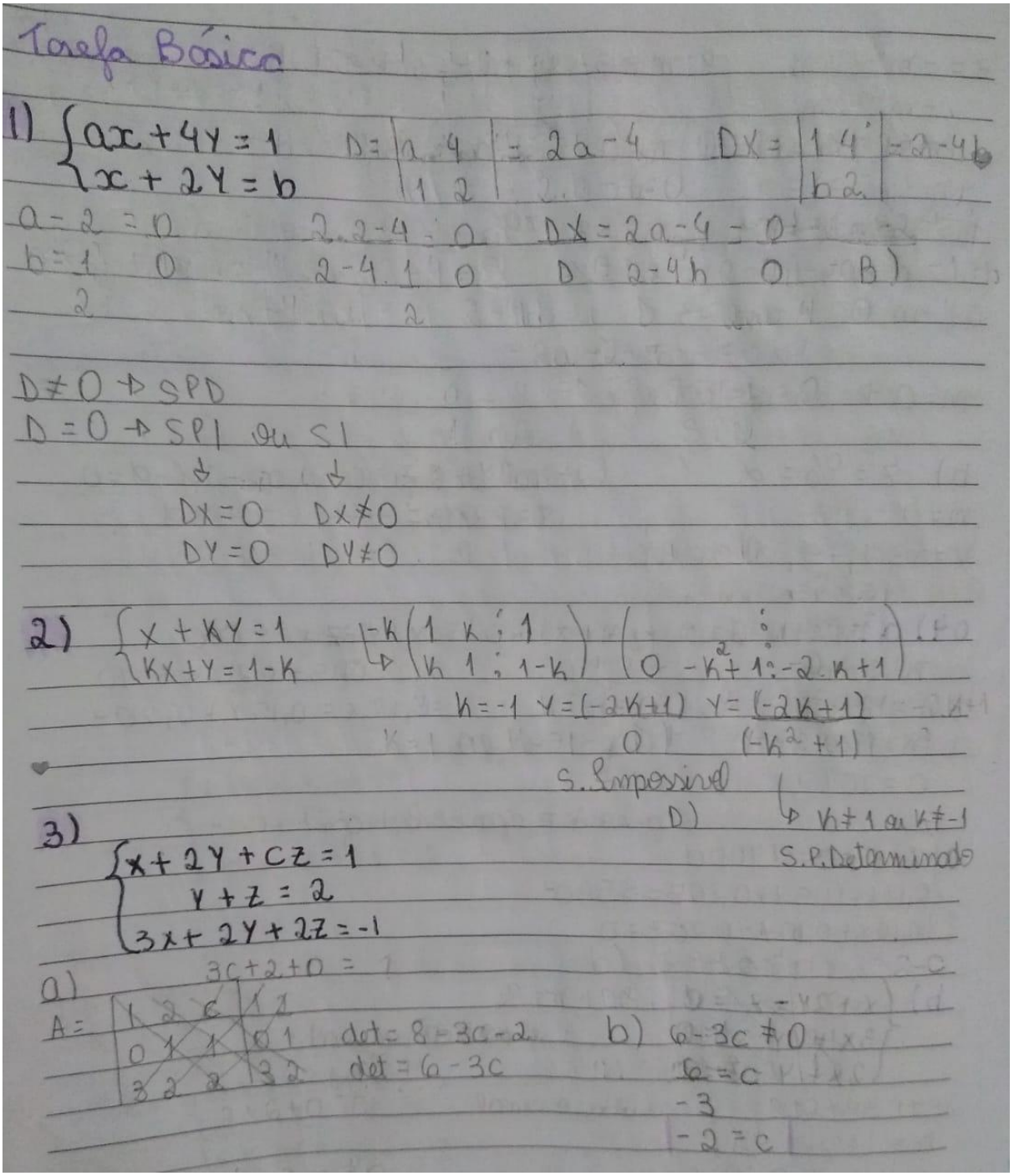
NOME: Gabriely Cristina **CTII**: 317

DISCUSSÃO SOBRE SISTEMAS LINEARES



4) $\begin{cases} x - y = k \\ 12x - ky + z = 1 \\ 36x + kz = 2 \end{cases}$

$D = \begin{vmatrix} 1 & -1 & 0 \\ 12 & -k & 1 \\ 36 & 0 & k \end{vmatrix}$ $\begin{matrix} 1 & -1 \\ 12 & -k \\ 36 & 0 \end{matrix}$

$0+0+(-12k) = -12k$

$\det = -k^2 - 36 - 12k$

$-x^2 + (-36) + 0 = -x^2 - 36$

$D \neq 0 \rightarrow -k^2 - 36 - 12k \ (-1)$

$k^2 + 12x + 36$

$6 \cdot 6 = 36 \rightarrow 6 + 6 = 12$

$6 + 6 = 12$

$6 \cdot 6 = 36$

S P

$k \neq 6$

E)

5) $\begin{cases} x-y+z=6 \\ 2x+y-z=-3 \\ x+2y-z=-5 \end{cases}$

$x-y+z=6$
$2x+y-z=-3$
$3y-2z=-11$

$x-y+z=6$
$3y-3z=-15$
$0-z=-4$
$z=4$

$3y-2\cdot4=-11$
$3y-8=-11$
$3y=-3$
$y=-1$

$x+1+4=6$
$x+5=6$
$x=6-5$
$x=1$

x, y, z
$1, -1, 4 = -4$

B)

6) $\begin{cases} x+y+z=k \\ kx+y+z=1 \\ x+y-z=k \end{cases}$

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

$k=1 \Rightarrow D=0$

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

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

$0+0-2z=0$
$z=0$

$x+y=1$
$x=1-y$

$k=1, (1-y, y, 0)$

D)

7) $\begin{cases} x+y+z=1 \\ mx-2y+4z=5 \\ m^2x+4y+16z=25 \end{cases}$

$D = \begin{vmatrix} 1 & 1 & 1 \\ m & -2 & 4 \\ m^2 & 4 & 16 \end{vmatrix} \begin{matrix} 1 & 1 \\ m & -2 \\ m^2 & 4 \end{matrix} = -32+4m^2+4m+16m-16-2m^2 = 6m^2-12m-48$

$6m^2-12m-48=0$

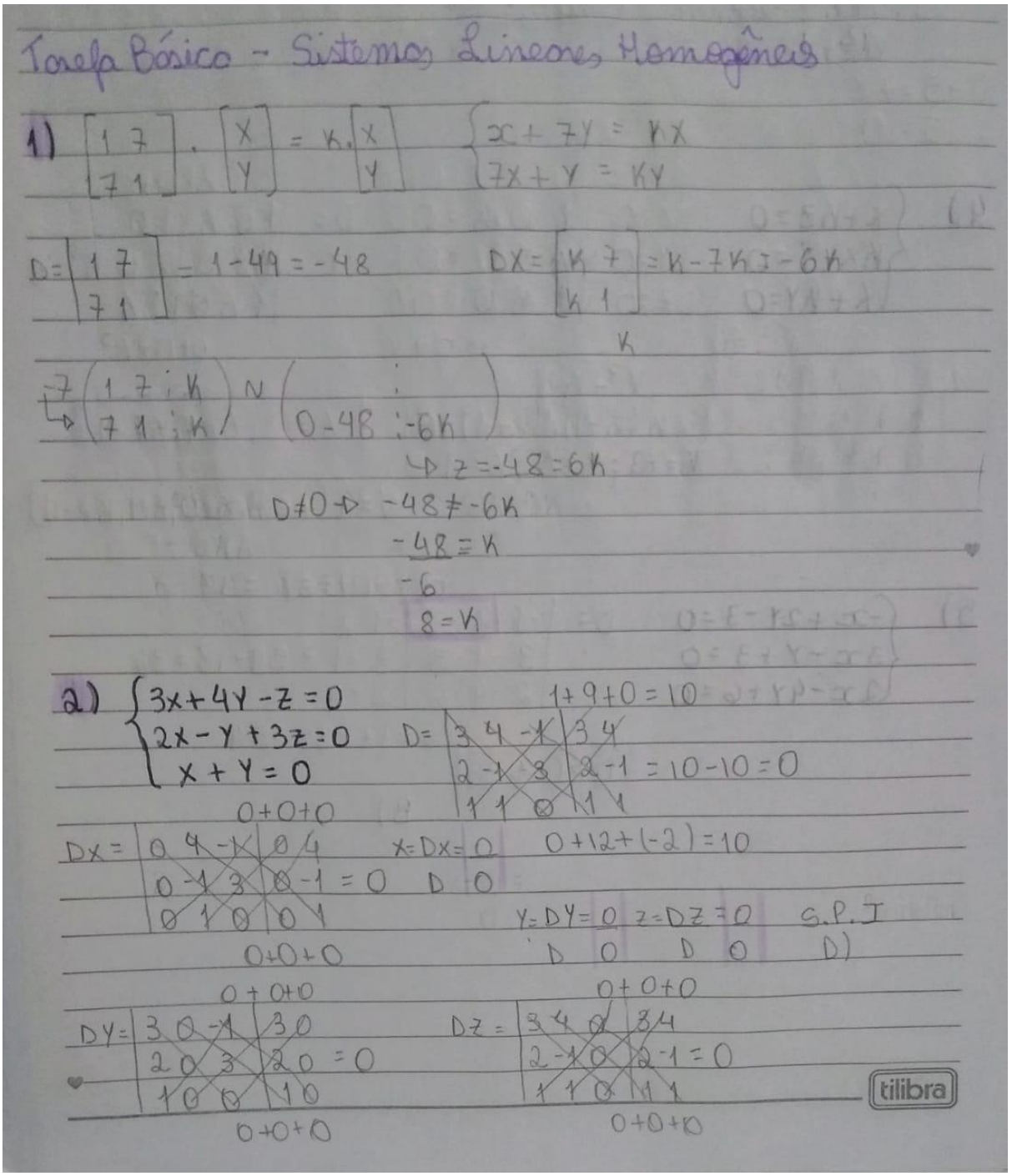
$\Delta = 12^2 - 4 \cdot 6 \cdot (-48)$
$\Delta = 144 + 1152$
$\Delta = 1296$

$x_1 = \frac{12+36}{2 \cdot 6} = \frac{48}{12} = 4$

$4-2=2$

$x_2 = \frac{12-36}{2 \cdot 6} = \frac{-24}{12} = -2$

SISTEMAS LINEARES HOMOGÊNEOS



$3+4k+3k = 3+7k$

3) $\begin{cases} x+y+z=0 \\ kx+3y+4z=0 \\ x+ky+3z=0 \end{cases}$ $D = \begin{vmatrix} 1 & 1 & 1 \\ k & 3 & 4 \\ 1 & k & 3 \end{vmatrix}$ $\begin{matrix} 1 & 1 \\ k & 3 \\ 1 & k \end{matrix}$

Soma k $\quad 9+4+k^2 = 13+k^2$

$2+5=7$

$13+k^2 = 3+7k$

$k^2+7k+10=0$ → D)

$2+5=7$

$2 \cdot 5 = 10$

$k+0+0$

4) $\begin{cases} x+kz=0 \\ kx+y=0 \\ x+ky=0 \end{cases}$ $\begin{cases} DX=0 \\ DY=0 \\ DZ=0 \end{cases}$ $\begin{cases} 1 & 0 & k = 0 \\ k & 1 & 0 = 0 \\ 1 & k & 0 = 0 \end{cases}$ $D = \begin{vmatrix} 1 & 0 & k \\ k & 1 & 0 \\ 1 & k & 0 \end{vmatrix}$ $\begin{matrix} 1 & 0 \\ k & 1 \\ 1 & k \end{matrix}$ $= k^3 - k$

$0+0+k^3$

k^3-k

$k(k-1)\cdot(k+1)=0$ $\quad k \neq 0, k \neq 1, k \neq -1$

$k=-1, k=0, k=1$

$V = \{(k \in \mathbb{R} \mid k \neq 0, k \neq 1, k \neq -1)\}$

A)

$-6+(-12)+36 = 18$

5) $\begin{cases} -x+2y-3=0 \\ 3x-y+3=0 \\ 2x-4y+6=0 \end{cases}$ $D = \begin{vmatrix} -1 & 2 & -3 \\ 3 & -1 & 3 \\ 2 & -4 & 6 \end{vmatrix}$ $\begin{matrix} -1 & 2 \\ 3 & -1 \\ 2 & -4 \end{matrix}$ $= 54-18 = 36$

$6+12+36 = 54$

$D \neq 0 \rightarrow 36$

B)