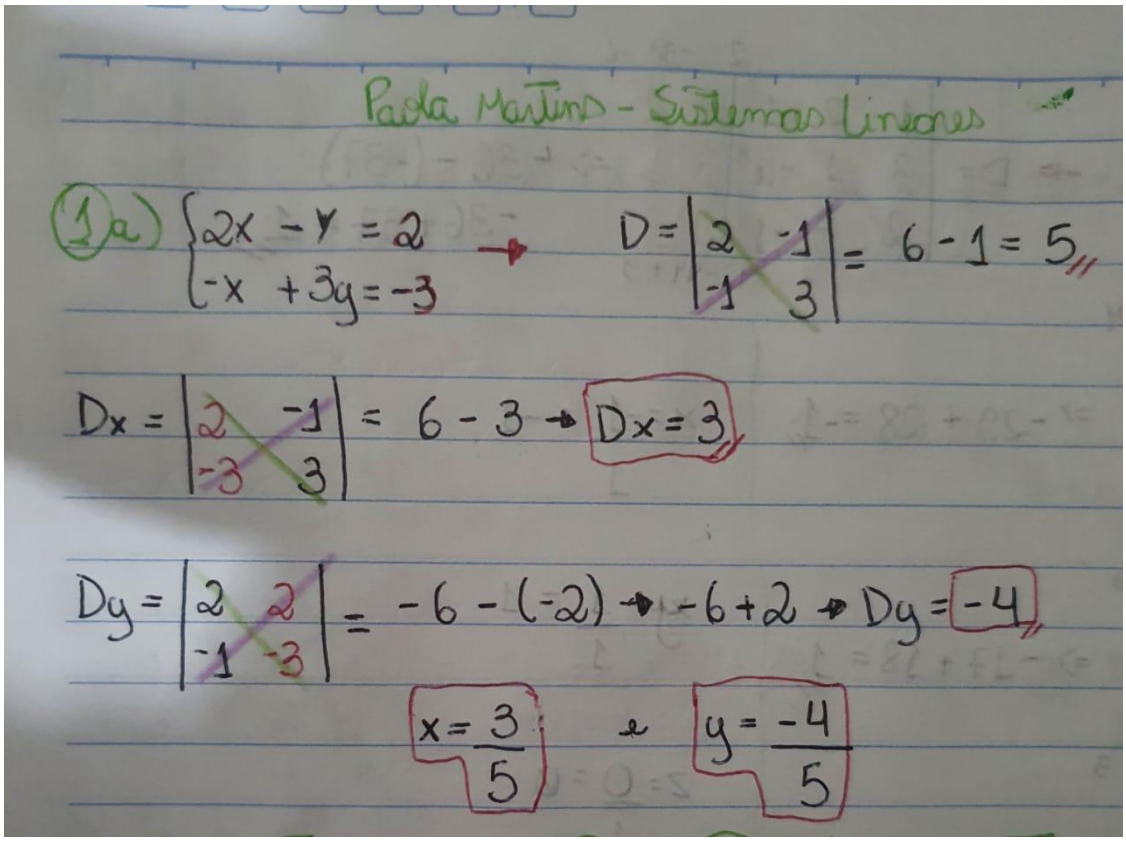
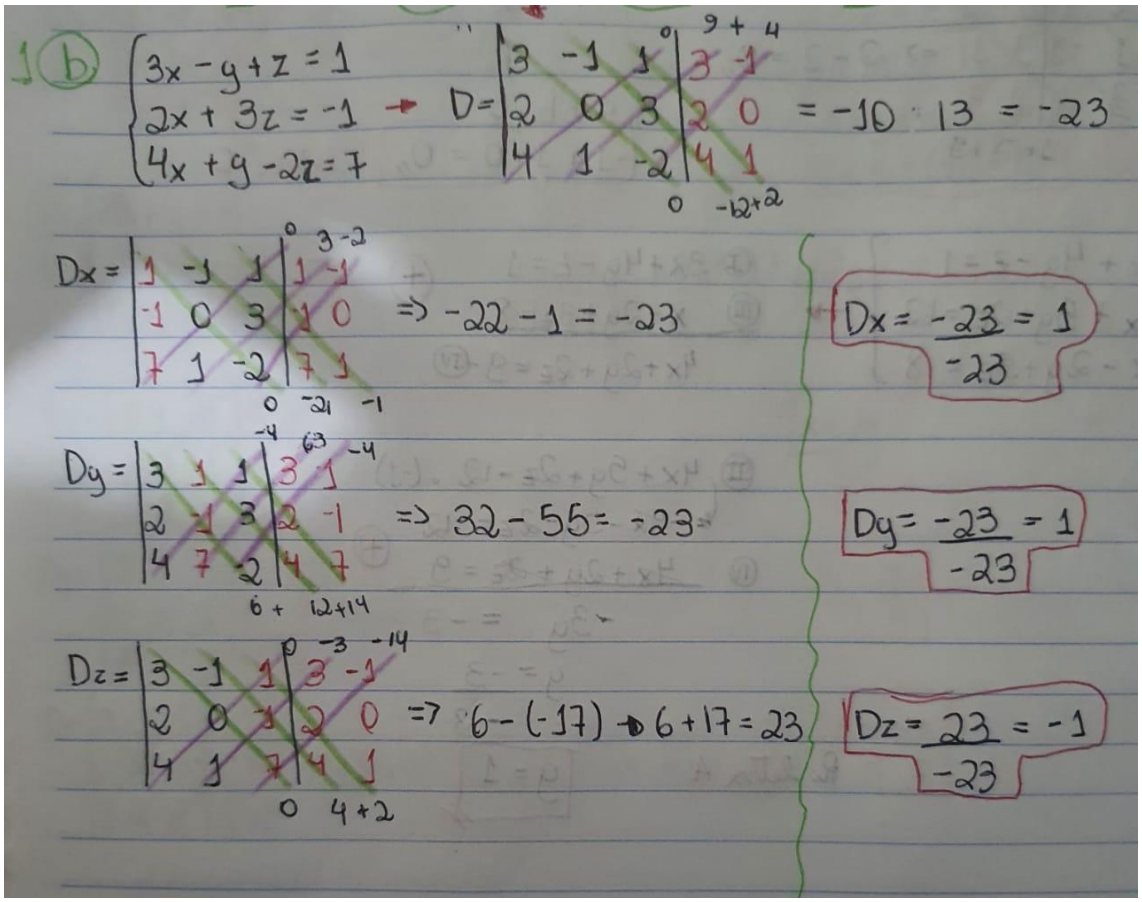
Nome: Paola Martins da Silva ------ **Turma:** CTII 317 ----- Data: 10/06/2021

TAREFA BÁSICA – SISTEMAS LINEARES– ESCALONAMENTO (GAUSS)





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3) $\begin{cases} x + 2y + z = 1 \\ 3x + y - 11z = -2 \\ 2x + 3y - z = 1 \end{cases}$ → $D = \begin{vmatrix} 1 & 2 & 1 \\ 3 & 1 & -11 \\ 2 & 3 & -1 \end{vmatrix}$ (2, -33, -6 / -1, -44, 9)

$\Rightarrow 36 - (-37)$

$-36 + 37 = 1$ //

$D_x = \begin{vmatrix} 1 & 2 & 1 \\ -2 & 1 & -11 \\ 1 & 3 & -1 \end{vmatrix}$ (1, -33, 4 / -1, -22, -6)

$\Rightarrow -29 + 28 = -1$ //

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

$D_y = \begin{vmatrix} 1 & 1 & 1 \\ 3 & -2 & -11 \\ 2 & 1 & -1 \end{vmatrix}$ (-9, -11, -3 / 2, -22, 3)

$\Rightarrow -17 + 18 = 1$ //

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

$D_z = \begin{vmatrix} 1 & 2 & 1 \\ 3 & 1 & -2 \\ 2 & 3 & 1 \end{vmatrix}$ (2, -6, 6 / 1, -9, 9)

$\Rightarrow 2 - 2 = 0$ //

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

$a + b + c$

$-1 + 1 + 0 = 0$ // letra C

2) $\begin{cases} \text{I}\ 3x + 4y - z = 1 \\ \text{II}\ 4x + 5y + 2z = 12 \\ \text{III}\ x - 2y + 3z = 8 \end{cases}$ →

(I) $3x + 4y - z = 1$

(III) $x - 2y + 3z = 8$ (+)

$4x + 2y + 2z = 9$ (IV)

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

$-4x - 5y - 2z = -12$

(IV) $4x + 2y + 2z = 9$ (+)

$-3y = -3$

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

$y = 1$

R: letra A

4) $\begin{cases} x + 2y - 3z = 29 \\ x + 3y + 2z = 4 \\ x - y - 2z = 8 \end{cases}$ → $D = \begin{vmatrix} 1 & 2 & -3 \\ 1 & 3 & 2 \\ 1 & -1 & -2 \end{vmatrix}$ (-9, -2, -4 / -6, 4, 3)

$\Rightarrow 1 + 15 = 16$

$D_x = \begin{vmatrix} 29 & 2 & -3 \\ 4 & 3 & 2 \\ 8 & -1 & -2 \end{vmatrix}$ (-72, -58, -16 / -174, 32, 12)

$\Rightarrow Dx = -130 + 146 = 16$ //

$x = \frac{16}{16} = 1$ //

$D_y = \begin{vmatrix} 1 & 29 & -3 \\ 1 & 4 & 2 \\ 1 & 8 & -2 \end{vmatrix}$ (-12, 16, -58 / -8, 58, -24)

$\Rightarrow 26 + 54 = 80$ //

$y = \frac{80}{16} = 5$ //

$D_z = \begin{vmatrix} 1 & 2 & 29 \\ 1 & 3 & 4 \\ 1 & -1 & 8 \end{vmatrix}$ (87, -4, 16 / 24, 8, -29)

$\Rightarrow 3 - 99 = -96$ //

$z = \frac{-96}{16} = -6$ //

$x + y + z$

$1 + 5 + (-6) = 0$ letra A

1+5+66

⑤ $\begin{cases} 2x+y=5 \\ 0+2y+z=3 \\ 3x+2y+z=7 \end{cases}$ → $D=\begin{vmatrix} 2 & 1 & 0 \\ 0 & 2 & 1 \\ 3 & 2 & 1 \end{vmatrix}$ $\begin{matrix} 2 & 1 \\ 0 & 2 \\ 3 & 2 \end{matrix}$ $\begin{matrix} 0 & 4 \\ 4 & 3 \end{matrix}$ $\begin{matrix} 0 \\ 0 \end{matrix}$ ⇒ 7 − 4 = 3//

$D_x=\begin{vmatrix} 5 & 1 & 0 \\ 3 & 2 & 1 \\ 7 & 2 & 1 \end{vmatrix}$ $\begin{matrix} 5 & 1 \\ 3 & 2 \\ 7 & 2 \end{matrix}$ $\begin{matrix} 0 & 10 \\ 10 & 2 \end{matrix}$ $\begin{matrix} 3 \\ 0 \end{matrix}$ ⇒ 17 − 13 = 4//

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

$D_y=\begin{vmatrix} 2 & 5 & 0 \\ 0 & 3 & 1 \\ 3 & 7 & 1 \end{vmatrix}$ $\begin{matrix} 2 & 5 \\ 0 & 3 \\ 3 & 7 \end{matrix}$ ⇒ (6+15) − (14) ⇒ 7//

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

$D_z=\begin{vmatrix} 2 & 1 & 5 \\ 0 & 2 & 3 \\ 3 & 2 & 7 \end{vmatrix}$ $\begin{matrix} 2 & 1 \\ 0 & 2 \\ 3 & 2 \end{matrix}$ ⇒ (28+9) − (30+12) ⇒ 37 − 42 = −5//

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

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

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

$D_x=\begin{vmatrix} 3 & 0 & 0 \\ 7 & 1 & 0 \\ -1 & 2 & 2 \end{vmatrix}$ $\begin{matrix} 3 & 0 \\ 7 & 1 \\ -1 & 2 \end{matrix}$ $\begin{matrix} 0 & 0 & 0 \\ 6 & 0 & 0 \end{matrix}$ $D_x = 6$//

$x=\frac{6}{2} \Rightarrow x=3$

$D_y=\begin{vmatrix} 1 & 3 & 0 \\ 2 & 7 & 0 \\ -1 & -1 & 2 \end{vmatrix}$ $\begin{matrix} 1 & 3 \\ 2 & 7 \\ -1 & -1 \end{matrix}$ $\begin{matrix} 0 & 0 & 12 \\ 14 & 0 & 0 \end{matrix}$ ⇒ 14 − 12 = 2//

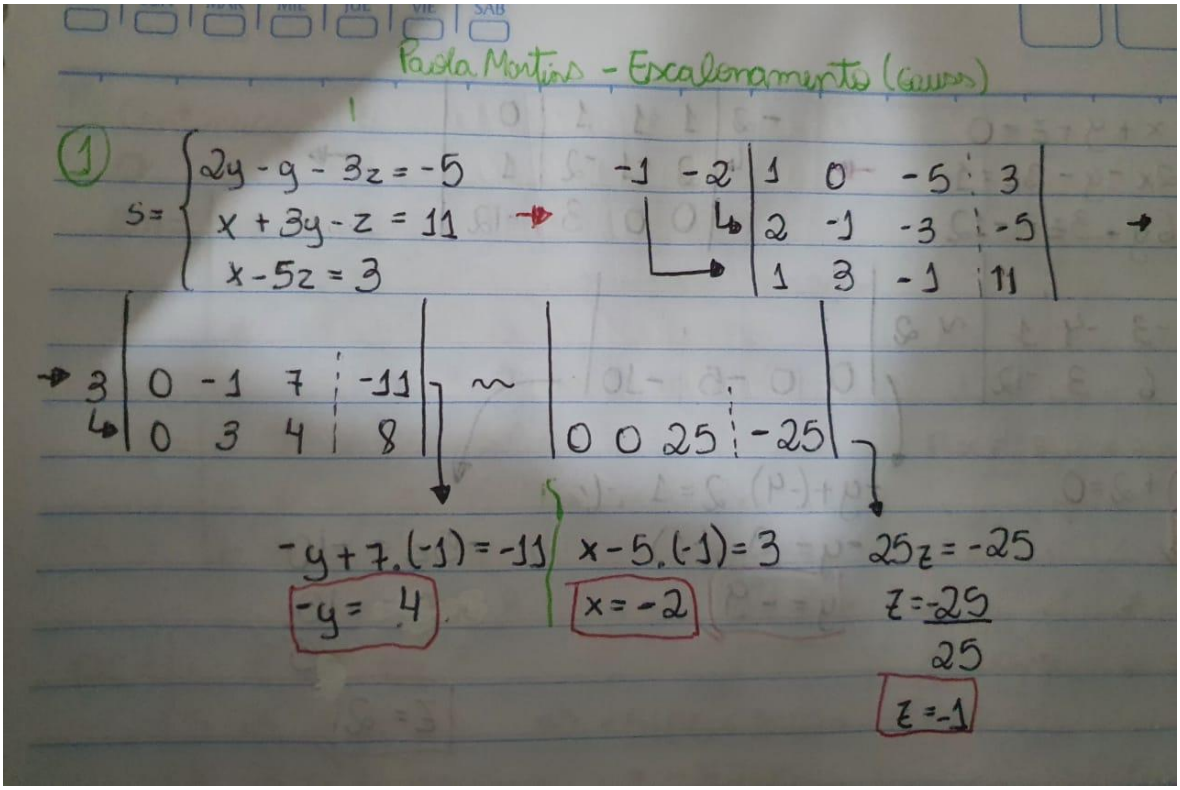
$y=\frac{2}{2} \rightarrow y=1$

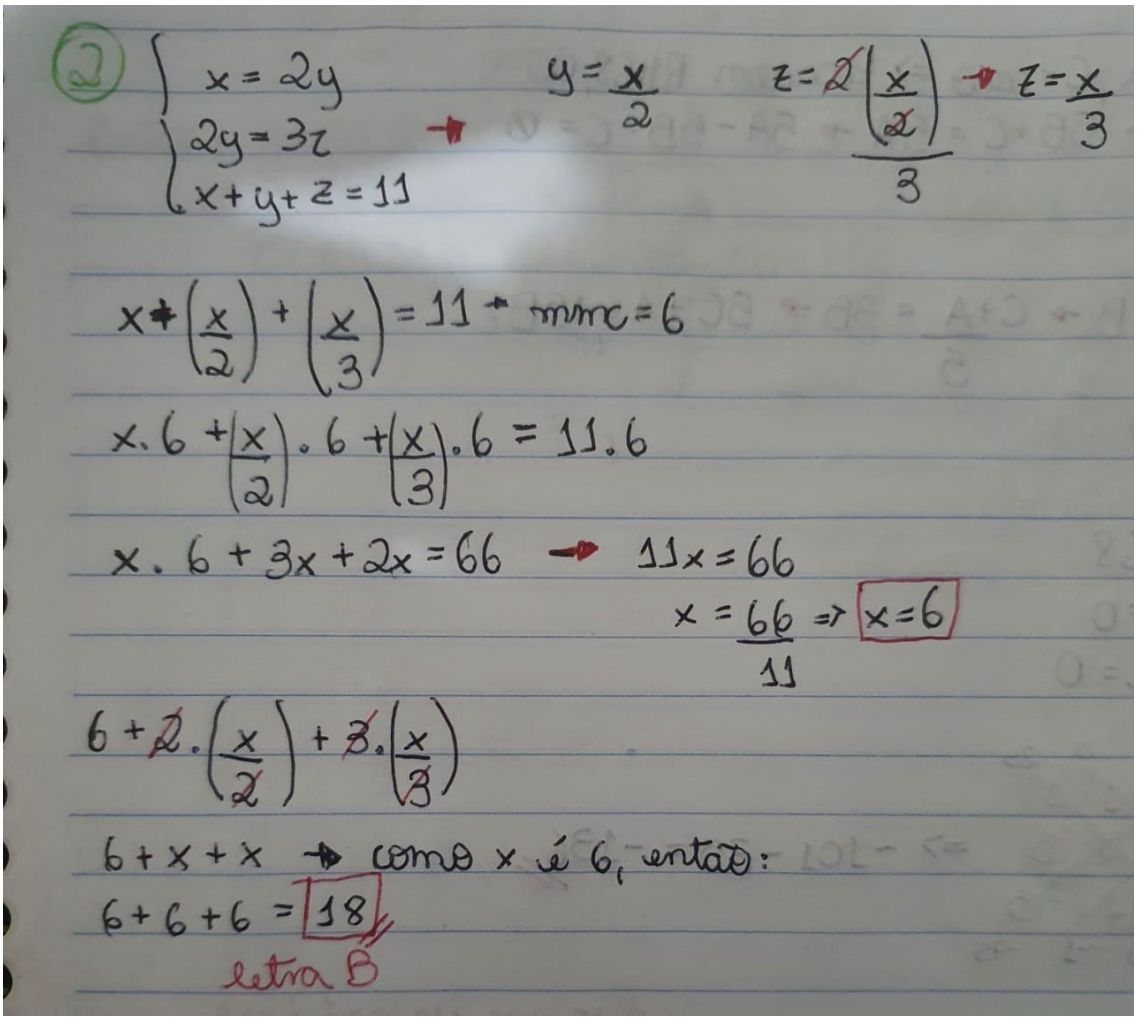
$D_z=\begin{vmatrix} 1 & 0 & 3 \\ 2 & 1 & 7 \\ -1 & 2 & -1 \end{vmatrix}$ $\begin{matrix} 1 & 0 \\ 2 & 1 \\ -1 & 2 \end{matrix}$ $\begin{matrix} -3 & 14 & 0 \\ -1 & 0 & 12 \end{matrix}$ ⇒ 11 − 11 = 0//

$z=\frac{0}{2} = z=0$

Letra E

ESCALONAMENTO





03

$$\begin{cases} x+y+z=0 \\ 2x-y-2z=1 \\ 6y+3z=-12 \end{cases}$$

$$\begin{array}{r|cccc} -2 & 1 & 1 & 1 & 0 \\ 4 & 2 & -1 & -2 & 1 \\ & 0 & 0 & 3 & -12 \end{array} \rightarrow$$

$$\begin{array}{r|cccc} \rightarrow 2 & 0 & -3 & -4 & 1 \\ 4 & 0 & 6 & 3 & -12 \end{array} \sim \begin{array}{|cccc|} 0 & 0 & -5 & -10 \end{array}$$

$x+(-9)+2=0$

$x=7$

$-y+(-4).2=1$

$-y=9 \cdot (-1)$

$y=-9$

$-5z=-10$

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

$z=2$

04 A = Ali ; B = bia ; C = caco => Possuem R$68,00

$B+\frac{20}{100}.C=A \rightarrow 5B+C=5A \rightarrow 5A-5B-C=0$

$C+\frac{20}{100}=A=3.B \rightarrow \frac{C+A}{5}=3B \rightarrow 5C+A=15B$

$A-15B+5C=0$

$$\begin{cases} A+B+C=68 \\ 5A-5B-C=0 \\ A-15B+5C=0 \end{cases}$$

$$D=\begin{vmatrix} 1 & 1 & 1 \\ 5 & -5 & -1 \\ 1 & -15 & 5 \end{vmatrix} \begin{matrix} 1 & 1 \\ 5 & -5 \\ 1 & -15 \end{matrix}$$

-5 15 25

-25 -1 -75

$\Rightarrow -101-35=-136$

CONTINUA NA PRÓXIMA

④ Continuação

D

$$DA=\begin{vmatrix}68 & 1 & 1\\ 0 & -5 & -1\\ 0 & -15 & 5\end{vmatrix}\begin{matrix}68 & 1\\ 0 & -5\\ 0 & -15\end{matrix}$$

0 1020 0 ; -1700 0 0

$\Rightarrow -1700-1020=$

$=-2720$

$$DB=\begin{vmatrix}1 & 68 & 1\\ 5 & 0 & -1\\ 1 & 0 & 5\end{vmatrix}\begin{matrix}1 & 68\\ 5 & 0\\ 1 & 0\end{matrix}$$

0 1700 ; 0 -68 0

$\Rightarrow -68-1700=$

$=-1768$

$$DC=\begin{vmatrix}1 & 1 & 68\\ 5 & -5 & 0\\ 1 & -15 & 0\end{vmatrix}\begin{matrix}1 & 1\\ 5 & -5\\ 1 & -15\end{matrix}$$

-340 0 0 ; 0 0 -5100

$\Rightarrow -5100+340=$

$=-4760$

$A=\frac{-2720}{-136}=20$

$B=\frac{-1768}{-136}=13$

$C=\frac{-4760}{-136}=35$

Então: A = R$ 20,00

B = R$ 13,00

C = R$ 35,00 → C − A → 35 − 20 = 15 — letra A

⑤

$$A=\begin{vmatrix}0 & 3 & 4\\ 1 & 0 & 5\\ 2 & 1 & 0\end{vmatrix} \quad X=\begin{vmatrix}x\\ y\\ z\end{vmatrix}$$

Alfeu = 134 reais → $3y+4z=134$

Bento = 115 reais → $x+5z=115$

Cintia = 48 reais → $2x+y=48$

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

0 30+4

$\Rightarrow 34$

$$D_x=\begin{vmatrix}134 & 3 & 4\\ 115 & 0 & 5\\ 48 & 1 & 0\end{vmatrix}\begin{matrix}134 & 3\\ 115 & 0\\ 48 & 1\end{matrix}$$

0 670 0 ; 0 720+460

$\Rightarrow 1180-670=$

$=510$

$x=\frac{510}{34}=15$

$$D_y=\begin{vmatrix}0 & 134 & 4\\ 1 & 115 & 5\\ 2 & 48 & 0\end{vmatrix}\begin{matrix}0 & 134\\ 1 & 115\\ 2 & 48\end{matrix}$$

-920 0 0 ; 0 1340+192

$\Rightarrow 1532-920=$

$=612$

$y=\frac{612}{34}=18$

$$D_z=\begin{vmatrix}0 & 3 & 134\\ 1 & 0 & 115\\ 2 & 1 & 48\end{vmatrix}\begin{matrix}0 & 3\\ 1 & 0\\ 2 & 1\end{matrix}$$

0 0 144 ; 0 690+134

$\Rightarrow 824-144=$

$=680$

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

$15+18+20=$ 53 reais

letra A.