S T Q Q S S D

__/__/__

Tarefa Básica

1-a) $\begin{cases} 2x - y = 2 \\ -x + 3y = -3 \end{cases}$ $D = \begin{vmatrix} 2 & -1 \\ -1 & 3 \end{vmatrix} = 6 - 1 = 5$

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

$D_y = \begin{vmatrix} 2 & 2 \\ -1 & -3 \end{vmatrix} = -6 - (-2) = -4$ $\quad y = \frac{D_y}{D} = \frac{4}{5}$

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

b) $\begin{cases} 3x - y + z = 1 \\ 2x + 3z = -1 \\ 4x + y - 2z = 7 \end{cases}$ $D = \begin{vmatrix} 3 & -1 & 1 \\ 2 & 0 & 3 \\ 4 & 1 & -2 \end{vmatrix}$ $\begin{matrix} 0+9+4=13 \\ 0+3-2=1 \\ 0-12+2=-10 \end{matrix}$

$= -10 - 13 = -23$

$D_x = \begin{vmatrix} 1 & -1 & 1 \\ -1 & 0 & 3 \\ 7 & 1 & -2 \end{vmatrix} = -22 - 1 = -23$ $\quad x = \frac{D_x}{D} = \frac{-23}{-23} = 1$

$0 - 21 - 1 = -22$

$D_y = \begin{vmatrix} 3 & 1 & 1 \\ 2 & -1 & 3 \\ 4 & 7 & -2 \end{vmatrix}$ $\begin{matrix} -4+63-14=55 \\ 6+12+14=32 \\ 0-3-14=-17 \end{matrix}$ $\quad y = \frac{D_y}{D} = \frac{-23}{-23} = 1$

$= 32 - 55 = -23$

$D_z = \begin{vmatrix} 3 & -1 & 1 \\ 2 & 0 & -1 \\ 4 & 1 & 7 \end{vmatrix}$ $\quad z = \frac{D_z}{D} = \frac{23}{-23} = -1$

$6 - (-17) = 23$

$0 + 4 + 2 = 6$

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

__/__/__

S T Q Q S S D

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

$-5-12+48=31$

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

$45+8+8=61$

$-12+48+12=48$

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

$108+2-32=78$

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

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

$a=x \mid b=y \mid c=z$

$2-33-6=-37$

$D=\begin{vmatrix} 1 & 2 & 1 \\ 3 & 1 & -11 \\ 2 & 3 & -1 \end{vmatrix} \begin{matrix} 1 & 2 \\ 3 & 1 \\ 2 & 3 \end{matrix}$ $=(-36)-(-37)=1$

$-1-44+9=-36$

$1-33+4=-28$

$D_x=\begin{vmatrix} 1 & 2 & 1 \\ -2 & 1 & -11 \\ 1 & 3 & -1 \end{vmatrix} \begin{matrix} 1 & 2 \\ -2 & 1 \\ 1 & 3 \end{matrix}$ $=-29-28=-1$

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

$-1-22-6=-29$

$-4-11-3=-18$

$D_y=\begin{vmatrix} 1 & 1 & 1 \\ 3 & -2 & -11 \\ 2 & 1 & -1 \end{vmatrix} \begin{matrix} 1 & 1 \\ 3 & -2 \\ 2 & 1 \end{matrix}$ $=(-17)-(-18)=1$

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

$2-22+3=-17$

$2-6+6=2$

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

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

$1-8+2=2$

$a+b+c$

$x+y+z$

$-1+1+0=0$

C

S T Q Q S S D __/__/__

4- (x+y+z) = ?

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

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

$-9-2-4=-15$

$1 \cdot 3 = 1-(-15) = 16$

$-12-58-16=-146$

$-6+4+3=1$

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

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

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

$-174+32+12$

$-12+16-58=-54$

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

$= 26-(-54) = 80$

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

$-8+58-24=26$

$87-4+16=99$

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

$3-99 = -96$

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

$24+8-29=3$

$x+y+z$

$1+5-6=0$

$6-6=0$

A

0+0+0=0

5.)

x=?
y=?
z=?

$$\begin{cases} 2x + y + 0 = 5 \\ 0 + 2y + z = 3 \\ 3x + 2y + z = 7 \end{cases}$$

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

0+4+0=4

2·2·1 = 4
1·1·3 = 3
0·0·2 = 0

4+3+0=7

D = 4+3+0 − 0 − 0 − 6 = 7 − 4 = 3

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

0+10+3=13

5·2·1 = 10
1·1·7 = 7
0·3·2 = 0

10+7+0=17

1·3·2 = 6
5·1·7 = 35
0·2·1 = 0

0+14+0=14

D_x = 13 − 17 − 14 = −18

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

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

6+15+0=21

2·3·7 = 42
1·5·3 = 15
0·0·1 = 0

30+12+0=42

D_y = 21 − 42 − 15 = −36

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

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

28+9+0=37

2·2·7 = 28
1·3·3 = 9
0·5·2 = 0

D_z = 37 − 28 − 9 = −5

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

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

6-

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

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad \begin{vmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -1 & 2 & 2 \end{vmatrix} \quad \begin{vmatrix} 1x & y.0 & 0z \\ 2x & 1.y & 0.z \\ -1x & 2.y & 2z \end{vmatrix}$$

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

S T Q Q S S D

__/__/__

0+0+0=0

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

2+0+0=2

0+0+0=0

$$Dx = \begin{vmatrix} 3 & 0 & 0 & 3 & 0 \\ 7 & 1 & 0 & 7 & 1 \\ -1 & 2 & 2 & -1 & 2 \end{vmatrix} \quad 6-0=6$$

6+0+0=6

$$x = \frac{Dx}{D} = \frac{6}{2} = 3$$

0+0+0=0

$$Dy = \begin{vmatrix} 1 & 3 & 0 & 1 & 3 \\ 2 & 7 & 0 & 2 & 7 \\ -1 & -1 & 2 & -1 & -1 \end{vmatrix} \quad 14-0=14$$

14+0+0=14

$$y = \frac{Dy}{D} = \frac{14}{2} = 7$$

-3+14+0=11

$$Dz = \begin{vmatrix} 1 & 0 & 3 & 1 & 0 \\ 2 & 1 & 7 & 2 & 1 \\ -1 & 2 & -1 & -1 & 2 \end{vmatrix} \quad 11-11=0$$

-1+0+12=11

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

z = 0 F

Tarefa Básica - Escalonamento

1-

$$\begin{cases} 2x - y - 3z = -5 \\ x + 3y - z = 11 \\ x + 0 - 5z = 3 \end{cases}$$

$$\begin{pmatrix} 2 & -1 & -3 & \vdots & -5 \\ 1 & 3 & -1 & \vdots & 11 \\ 1 & 0 & -5 & \vdots & 3 \end{pmatrix} \sim \begin{pmatrix} 7 & 0 & -10 & \vdots & -4 \\ 1 & 0 & -5 & \vdots & 3 \end{pmatrix} \sim \begin{pmatrix} & & & \vdots & \\ 0 & 0 & 25 & \vdots & -25 \end{pmatrix}$$

×3; x·7-1

$25z = -25$

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

$7x - 10z = -4$
$7x - 10 \cdot -1 = -4$
$7x + 10 = -4$
$7x = -4 - 10$
$7x = -14$
$x = -\frac{14}{7}$
$\boxed{x = -2}$

$2x - y - 3z = -5$
$2 \cdot (-2) - y - 3 \cdot (-1) = -5$
$-4 - y - 3 = -5$
$-4 + 5 + 3 = y$
$\boxed{y = 4}$

$\boxed{x = -2;\ y = 4;\ z = -1}$

Tarefa Básica - Escalonamento

1-

$$\begin{cases} 2x - y - 3z = -5 \\ x + 3y - z = 11 \\ x + 0 - 5z = 3 \end{cases}$$

$$\begin{pmatrix} 2 & -1 & -3 & \vdots & -5 \\ 1 & 3 & -1 & \vdots & 11 \\ 1 & 0 & -5 & \vdots & 3 \end{pmatrix} \sim \begin{pmatrix} 7 & 0 & -10 & \vdots & -4 \\ 1 & 0 & -5 & \vdots & 3 \end{pmatrix} \sim \begin{pmatrix} & & & \vdots & \\ 0 & 0 & 25 & \vdots & -25 \end{pmatrix}$$

x3; x-7-1

$25z = -25$

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

$7x - 10z = -4$
$7x - 10 \cdot -1 = -4$
$7x + 10 = -4$
$7x = -4 - 10$
$7x = -14$
$x = -\frac{14}{7}$
$\boxed{x = -2}$

$2x - y - 3z = -5$
$2 \cdot (-2) - y - 3 \cdot (-1) = -5$
$-4 - y - 3 = -5$
$-4 + 5 + 3 = y$
$\boxed{y = 4}$

$\boxed{x = -2;\ y = 4;\ z = -1}$

__/__/__

S T O O S S D

2-

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

$2y = 3z \Rightarrow z = \frac{2y}{3}$

$x = 2y$

$x+y+z = 11$

$2y + y + \frac{2y}{3} = 11 \quad (.3)$

$6y + 3y + 2y = 33$

$11y = 33$

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

$y = 3$

$x = 2y$

$x = 2.3$

$x = 6$

$2y = 3z$

$2.3 = 3z$

$6 = 3z$

$z = \frac{6}{3}$

$z = 2$

$x + 2y + 3z = ?$

$6 + 2.3 + 3.2 = ?$

$6 + 6 + 6 = \boxed{18}$

$x + 2y + 3z = 18$

B

3-

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

$$\begin{pmatrix} 1 & 1 & 1 & : & 0 \\ 2 & -1 & -2 & : & 1 \\ 0 & 6 & 3 & : & -12 \end{pmatrix} \sim \begin{pmatrix} & & & : & \\ 0 & -3 & -4 & : & 1 \\ 0 & 6 & 3 & : & -12 \end{pmatrix} \sim$$

$$\sim \begin{pmatrix} & & & : & \\ & & & : & \\ 0 & 0 & -5 & : & -10 \end{pmatrix}$$

$-5z = -10$

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

$\boxed{z = 2}$

D

S T Q Q S S D

__/__/__

4- $A+B+C=68$

A = Ali

B = Bia

C = Caco

$B+\frac{20}{100}\cdot C = A \rightarrow B+0,2C=A$

$C+\frac{20}{100}\cdot A = 3B \rightarrow C+0,2A=3B$

$A+B+C=68$ (I)

$B+0,2C=A$ (II)

$C+0,2A=3B$ (III)

I → II:

$(B+0,2C)+B+C=68 \rightarrow B=\frac{68-1,2C}{2} \rightarrow \boxed{B=34-0,6C}$

$2B+1,2C=68$

III = $0,2A+C=3(34-0,6C)$

$0,2A+C=102-1,8C$

$0,2A+2,8C=102 \Rightarrow$ II

$0,2(B+0,2C)+2,8C=102$

$0,2B+0,4C+2,8C=102$

$0,2B+2,84C=102$

$0,2(34-0,6C)+2,84C=102$

$6,8-0,12C+2,8C=102$

$6,8+2,72C=102$

$2,72C=102-6,8$

$2,72C=95,2$

$C=\frac{95,2}{2,72}$

$\boxed{C=35}$

$B=34-0,6C$

$B=34-0,6\cdot 35$

$B=34-21$

$\boxed{B=13}$

$A+B+C=68$

$A+13+35=68$

$A+48=68$

$A=\frac{68}{48}$

$\boxed{A=20}$

A tem R$ 20,00

B tem R$ 13,00

C tem R$ 35,00

C - A

35 - 20 = 15

Ali tem R$ 15,00 reais a menos que Caco

A