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$$Dx = \begin{vmatrix} 1 & 4 \\ \frac{1}{2} & 2 \end{vmatrix}$$

$$Dx = 1 \cdot \frac{1}{2} - (4 \cdot 2)$$

$$0,5 - 8$$

$$Dx = -7,5$$

$$x = \frac{Dx}{D}$$

$$x = \frac{-7,5}{16}$$

$$x = -0,46\ldots$$

$$Dy = \begin{vmatrix} 10 & 1 \\ 1 & \frac{1}{2} \end{vmatrix}$$

$$Dy = 10 \cdot \frac{1}{2} - (1 \cdot 1)$$

$$Dy = 5 - 1$$

$$Dy = 4$$

$$y = \frac{Dy}{B}$$

$$y = \frac{4}{16}$$

$$y = 0,25$$

A \rightarrow incorrecta

$x = -0,46$ - Valores
 $y = 0,25$ - Diferentes

11

b. \rightarrow verdadeira

$$a=2$$

$$\begin{cases} 2x + 4y = 1 \\ x + 2y = b \end{cases}$$

$$D = \begin{vmatrix} 2 & 4 \\ 1 & 2 \end{vmatrix}$$

$$D = 2 \cdot 2 - (1 \cdot 4)$$

$$D = 4 - 4$$

$$D = 0$$

$E = 1 -$ \rightarrow sistema indeterminado, existe
 $1 - 1$ tem 'n' respostas para o
 $= b$ problema

c. 1

\rightarrow falso

$$E = A - B = I - A$$

D. Se $a=2$ o sistema tem
'n' valores, podendo se adaptar
a diversos resultados

e: Se $a=2$ o sistema se torna
indeterminado.

02.

$$\begin{cases} x + ky = 1 \\ kx + y = 1 - k \end{cases}$$

I - $k = 2 \rightarrow$ valor de teste
 \hookrightarrow falso

$$D = \begin{vmatrix} x + 2y & 1 \\ 2x + y & 1-2 \end{vmatrix}$$

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

$$D = 1 \cdot 1 - (2 \cdot 2)$$

$$D = 1 - 4$$

$$D = -3$$

\hookrightarrow sistema possível e determinado.

II-

$$k = 1.$$

$$D = \begin{vmatrix} x + 1y & 1 \\ 1x + y & 1-1 \end{vmatrix}$$

$$D = \begin{vmatrix} 1 & 1 \\ 1 & 1 \end{vmatrix}$$

$$D = 1 \cdot 1 - (1 \cdot 1)$$

$$D = 1 - 1$$

$$D = 0$$

\hookrightarrow sistema impossível

III -

$$k = 2$$

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

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

$$D = 1 \cdot 1 - (2 \cdot 2)$$

$$D = 1 - 4$$

$$D = -3$$

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

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

$$DX = 1 \cdot 1 - (-1 \cdot 2)$$

$$DX = 1 + 2$$

$$DX = 3$$

$$DY = (1 \cdot -1) - (2 \cdot 1)$$

$$DY = -1 - 2$$

$$DY = -3$$

$$x = DX$$

$$D$$

$$y = \frac{DY}{D}$$

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

$$y = 1$$

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

$$x = -1$$

D

↓
Valores
DIFERENTES

11

03.

$$\begin{cases} x + 2y + c_3 = 1 \\ y + 3 = 2 \\ 3x + 2y + 2z = -1 \end{cases}$$

a.

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

$$DA = 2 + 6 + 0 - (3c + 2 + 0)$$
$$8 - 2 - 3c$$

$$DA = 6 - 3c$$

b.

$$\begin{aligned} a &= 6 - 3c \\ -6 &= -3c \\ -\frac{6}{3} &= c \\ c &= 2 \end{aligned}$$

$$DA = 6 - 3 \cdot 2$$

$$DA = 6 - 6$$

$$DA = 0$$

$$Dx = 1$$

1 / 1

$$D = \left\{ \begin{array}{ccc|cc} 1 & 2 & -2 & 1 & 2 \\ 0 & 1 & 1 & 0 & 1 \\ -1 & 2 & 2 & -1 & 2 \end{array} \right.$$

$$2 - 2 + 8 - (-2 + 2 + 8) \\ 8 - 8 \\ 0$$

$$Dy = \left\{ \begin{array}{ccc|cc} 1 & 1 & 2 & 1 & 1 \\ 0 & 2 & 1 & 0 & 2 \\ 3 & -1 & 2 & 3 & -1 \end{array} \right.$$

$$4 + 3 + 0 - (12 - 1 + 0) \\ 7 - 11 \\ -3$$

$$D_3 = \left\{ \begin{array}{ccc|cc} 1 & 2 & 1 & 1 & 2 \\ 0 & 1 & 2 & 0 & 1 \\ 3 & 2 & -1 & 3 & 2 \end{array} \right.$$

$$-1 + 12 + 0 - (3 + 4 + 0) \\ 11 - 7 \\ 3$$

$$x = \frac{0}{0} = 0 ; \quad 7$$

$$y = \frac{-3}{0} = 0 ; \quad \rightarrow \text{Valor Único} - \{2\}$$

$$z = \frac{3}{0} = 0$$

11

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

A.

$k=2$

$$Dx = \left(\begin{array}{ccc|cc} 1 & -1 & 0 & 1 & -1 \\ 12 & -2 & 1 & 12 & -2 \\ 36 & 0 & 2 & 36 & 0 \end{array} \right)$$

$$\begin{aligned} -4 - 36 + 0 - (72 + 0 - 24) \\ -40 - 48 \end{aligned}$$

$$D = -8$$

\hookrightarrow Possibel.

B.

$k=3$

$$D = \left(\begin{array}{ccc|cc} 1 & -1 & 0 & 1 & -1 \\ 12 & -3 & 1 & 12 & -3 \\ 36 & 0 & 3 & 36 & 0 \end{array} \right)$$

$$\begin{aligned} -9 - 36 + 0 - (0 + 0 - 36) \\ -45 + 36 \end{aligned}$$

$$D = -9$$

\hookrightarrow Possibel

C.

$$k=4$$

$$D = \left[\begin{array}{ccc|cc} 1 & -1 & 0 & 1 & -1 \\ 12 & 4 & 1 & 12 & 4 \\ 36 & 0 & 4 & 36 & 0 \end{array} \right]$$

$$16 - 36 + 0 - (0 + 0 - 48)$$

$$20 + 48 = 68$$

$$D = 68$$

↳ Possibel

$$D =$$

$$k=5$$

$$D = \left[\begin{array}{ccc|cc} 1 & -1 & 0 & 1 & -1 \\ 12 & 5 & 1 & 12 & 5 \\ 36 & 0 & 5 & 36 & 0 \end{array} \right]$$

$$20 - 36 + 0 - (0 + 0 - 60)$$

$$16 + 60$$

$$D = 76$$

↳ Possibel

e. \rightarrow correta
 $k = 6$

$$D = \left\{ \begin{array}{ccc|cc} 1 & -1 & 0 & 1 & -1 \\ 12 & -6 & 1 & 12 & -6 \\ 36 & 0 & 6 & 36 & 0 \end{array} \right.$$

$$-36 - 36 + 0 - (0 + 0 - 72)$$

$$-72 + 72$$

$$0$$

$$D=0$$

\hookrightarrow impossível

05.

$$\left\{ \begin{array}{l} x - y + 3 = 6 \\ 2x + y - 3 = -3 \\ x + 3y - 3 = -5 \end{array} \right.$$

$$D = \left\{ \begin{array}{ccc|cc} 1 & -1 & 1 & 1 & -1 \\ 2 & 1 & -1 & 2 & 1 \\ 1 & 3 & -1 & 1 & -2 \end{array} \right.$$

$$-1 + 2 - 2 + 4 + 2 - 2$$

$$D = 3$$

$$D = 3$$

$$Dx = \begin{array}{ccc|cc} 6 & -1 & 1 & 6 & -1 \\ -3 & 1 & -1 & -3 & 1 \\ -5 & 2 & -1 & -5 & 2 \end{array}$$

$$+6 -5 -6 -(-5 -12 -3)$$

$$-17 +20$$

$$3$$

$$Dy = \begin{array}{ccc|cc} 1 & 6 & 1 & 1 & 6 \\ 2 & -3 & -1 & 2 & -3 \\ 1 & -5 & -1 & 1 & -5 \end{array}$$

$$3 \cdot 6 - 19 - (-3 + 5 - 12)$$

$$-13 + 10$$

$$-3$$

$$Dz = \begin{array}{ccc|cc} 1 & -1 & 6 & 1 & -1 \\ 2 & 1 & -3 & 2 & 1 \\ 1 & 2 & -5 & 1 & 2 \end{array}$$

$$-5 + 3 + 24 - (6 - 6 - 10)$$

$$22 + 10$$

$$12$$

$$x = \frac{3}{3} \quad y = \frac{-3}{3} \quad z = \frac{12}{3}$$

$$x = 1 \quad y = -1 \quad z = 4 \quad B$$

$$x - y \cdot z = 1 - 1 \cdot 4$$

$$-4$$

06.
$$\begin{cases} x + y + z = k \\ kx + y + z = 1 \\ x - y - z = k \end{cases}$$

a.

$$k=1.$$

$$D = \left| \begin{array}{ccc|cc} 1 & 1 & 1 & 1 & 1 \\ -1 & 1 & 1 & 1 & -1 \\ 1 & 1 & -1 & 1 & 1 \end{array} \right|$$

$$-1 + 1 + 1 - D (+1 + 1)$$

$$4 - Q$$

$$(2, 1)$$

\hookrightarrow Possive.

b.

$$k=Q$$

$$D = \left| \begin{array}{ccc|cc} 1 & 1 & 1 & 1 & 1 \\ 2 & 1 & 1 & 2 & 1 \\ 1 & 1 & -1 & 1 & 1 \end{array} \right|$$

$$-1 + 1 + Q - (1 + 1 - Q)$$

$$2 - 0$$

$$D = 2.$$

11

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

$$\begin{aligned} -2 + 2 + 1 - (2 + 2 - 1) \\ + 4 - 3 \\ -2 \end{aligned}$$

$$x = -1$$

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

$$\begin{aligned} -1 + 2 + 4 - (1 + 2 - 4) \\ 6 - 1 \\ 5 \end{aligned}$$

$$y = 2, 5$$

Respostas diferentes

C. falso, obtenemos diferentes valores, ao utilizar qualquer valor acima de 0

1 1 1

D. → Correcta

$$K=2$$

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

$$\begin{matrix} -1 + 1 + 2 & - (1 + 1 - 2) \\ 2 - 0 & 2 \end{matrix}$$

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

$$\begin{matrix} -2 + 2 + 1 & - (2 - 2 - 1) \\ 1 - 3 & \\ Dx = -2 & \end{matrix}$$

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

$$\begin{matrix} -1 + 2 + 4 & - (1 + 2 - 4) \\ 5 - 1 & \\ Dy = 4 & \end{matrix}$$

$$D_3 = \begin{array}{ccc|cc} 1 & 1 & 2 & 1 & 1 \\ 2 & 1 & 1 & 2 & 1 \\ 1 & 2 & 1 & 1 & 1 \end{array}$$

$$\begin{aligned} 2+1+4 - (2+2+4) \\ 7-8 \\ -1 \end{aligned}$$

$$\left. \begin{array}{l} x = -2 \quad x = -1 \\ y = \frac{5}{2} \quad y = 2 \end{array} \right\} \begin{array}{l} \text{valores} \\ \text{diferentes} \\ \text{para o mes-} \\ \text{mo } k. \end{array}$$

$$z = -\frac{1}{2} \quad z = 0,5$$

e.

$$k=0$$

$$\begin{array}{ccc|cc} 1 & 1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 0 & 1 \\ 1 & 1 & -1 & 1 & 1 \end{array}$$

$$-1+1+0 - (1+1+0)$$

$\frac{Q}{2}$

→ nenhum valor
consegue admitir
solução nula (0, 1 ou 2)

07.

a.

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

$$\left| \begin{array}{ccc|cc} 1 & 1 & 1 & 1 & 1 \\ 1 & -2 & 4 & 1 & -2 \\ 1 & 4 & 16 & 1 & 4 \end{array} \right| \quad (D)$$

$$-32 + 4 + 4 - (-2 + 16 + 16)$$

$$-24 + 30$$

$$D = 6.$$

↳ Possível e determinado

B.

↳ Correto

$$\left| \begin{array}{ccc|cc} 1 & 1 & 1 & 1 & 1 \\ 2 & -2 & 4 & 2 & -2 \\ 4 & 4 & 16 & 4 & 4 \end{array} \right|$$

$$-32 + 16 + 8 - (-8 + 16 + 32)$$

O
↳ Admite 'n' respostas

11

01.

$$\begin{bmatrix} 1 & 7 \\ 7 & 1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = k \begin{bmatrix} x \\ y \end{bmatrix}$$

$$\begin{aligned} x + 7y &= k \\ 7x + y &= k \end{aligned}$$

(A) → errada
 $k=2$

$$D = \begin{bmatrix} 1 & 7 \\ 7 & 1 \end{bmatrix}$$

$$D = 1 \cdot 1 - (7 \cdot 7)$$

$$1 - 49$$

$$D = -48$$

$$Dx = 2 \times 7$$

$$2 \times 1$$

$$2 \cdot 1 - 7 \cdot 2$$

$$2 - 14$$

$$-12$$

$$Dy = \frac{1}{7} \times 2$$

$$1 \cdot 2 - (7 \cdot 2)$$

$$2 - 14$$

$$-12$$

—<0

(B) → errada

$$k=4$$

$$DX = \begin{bmatrix} 4 & 7 \\ 4 & 1 \end{bmatrix}$$

$$4 \cdot 1 - (7 \cdot 4)$$

$$4 - 28$$

$$-24 \rightarrow \text{C.O}$$

$$DY = \begin{bmatrix} 1 & 4 \\ 7 & 4 \end{bmatrix}$$

$$1 \cdot 4 - (7 \cdot 4)$$

$$4 - 28$$

$$-24.$$

$$\hookrightarrow \text{C.O}$$

(C) → errada

$$k=5$$

$$DX = \begin{bmatrix} 5 & 7 \\ 5 & 1 \end{bmatrix}$$

$$DY = \begin{bmatrix} 1 & 5 \\ 7 & 5 \end{bmatrix}$$

$$5 \cdot 1 - (5 \cdot 7)$$

$$5 - 35$$

$$-30$$

$$\hookrightarrow \text{C.O}$$

$$5 \cdot 1 - (7 \cdot 5)$$

$$5 - 35$$

$$-30.$$

1 / 1

(D) → errada

$k=6$

$$\begin{bmatrix} 6 & 7 \\ 6 & 1 \end{bmatrix}$$

$$\begin{array}{r} 6 \cdot 1 - (7 \cdot 6) \\ 6 - 42 \\ -36 \end{array}$$

$$\begin{bmatrix} 1 & 6 \\ 7 & 6 \end{bmatrix}$$

$$\begin{array}{r} 6 \cdot 1 - (7 \cdot 6) \\ 6 - 42 \\ -36 \end{array}$$

→ inferior

a 1.

(e)

$k=8$

$$\begin{bmatrix} 8 & 7 \\ 8 & 1 \end{bmatrix}$$

$$\begin{array}{r} 8 \cdot 1 - 7 \cdot 8 \\ 8 - 56 \\ -48 \end{array}$$

$$\begin{bmatrix} 1 & 8 \\ 7 & 8 \end{bmatrix}$$

$$\begin{array}{r} 8 \cdot 1 - 7 \cdot 8 \\ 8 - 56 \\ -48 \end{array}$$

$$x = 1, 2$$

→ correta

$$x, y > 0$$

11

02.

$$\begin{cases} 3x + 4y - 3 = 0 \\ 2x - y + 3 = 0 \\ x + y = 0 \end{cases}$$

$$\left| \begin{array}{ccc|cc} 3 & 4 & -1 & 3 & 4 \\ 2 & -1 & 3 & 2 & -1 \\ 1 & 1 & 0 & 1 & 1 \end{array} \right|$$

$$0 + 10 - 2 - (4 + 9 + 0) \\ 10 - 10$$

$$D = 0$$

D

admite infinitas
soluções

03.

$$\begin{cases} x + y + 3 = 0 \\ kx + 3y + 4z = 0 \\ x + ky + 3z = 0 \end{cases}$$

(a)

$$\left| \begin{array}{ccc|cc} 1 & 1 & 1 & 1 & 1 \\ -7 & 3 & 3 & -7 & 3 \\ 1 & -7 & 3 & 1 & -7 \end{array} \right|$$

$$9 + 3 + 41 - (3 - 21 - 21) \\ 53 + 39$$

92

→ Possível e determinado

11

B.

$$\begin{array}{ccc|cc} 1 & 1 & 1 & 1 & 1 \\ -2 & 3 & 4 & -2 & 3 \\ 1 & -2 & 3 & 1 & -2 \end{array}$$

$$9 + 4 + 4 - (3 + 8 + 6)$$

$$17 + 14$$

28

↳ Possível e determinante

C.

$$\begin{array}{ccc|cc} 1 & 1 & 1 & 1 & 1 \\ 2 & 3 & 4 & 2 & 3 \\ 1 & 2 & 3 & 1+2 & \text{indeterminante} \end{array}$$

$$9 + 4 + 4 - (3 + 8 + 6)$$

$$17 - 17$$

O → "n" números Possíveis

D.

$$\begin{array}{ccc|cc} 1 & 1 & 1 & 1 & 1 \\ 7 & 3 & 4 & 7 & 3 \\ 1 & 7 & 3 & 1 & 7 \end{array}$$

$$9 + 4 + 41 - (9 + 28 + 21)$$

↳ Possível e determinado

04. $\begin{cases} x + k_3 = 0 \\ kx + y = 0 \\ x + ky = 0 \end{cases}$

(a) \rightarrow correta

$$k=0$$

\rightarrow calculo numérico para

$$\begin{array}{ccc|cc} 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & 1 & 0 \end{array}$$

$$0 + 0 + 0 - (0 + 0 + 0)$$

$$D=0$$

\rightarrow solução única
descartada

$$k=1$$

$$\begin{array}{ccc|cc} 1 & 1 & 0 & 1 & 1 \\ 1 & 0 & 1 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 \end{array}$$

$$0 + 1 + 0 - (0 + 0 + 1)$$

$$1-1$$

\rightarrow divisão menor
única

$$k = -1$$

$$\begin{array}{ccc|cc} 1 & 0 & -1 & 1 & 0 \\ -1 & 1 & 0 & -1 & 1 \\ 1 & -1 & 0 & -1 & -1 \end{array}$$

$$0 + 0 + -1 - (-1 + 0 + 0)$$

$$-1 + 1$$

$$0$$

↳ solução única

OS.

$$-x + 2y - 3 = 0$$

$$3x - y + 3 = 0$$

$$2x - 4y + 6 = 0$$

$$\begin{array}{ccc|cc} -1 & 2 & -3 & -1 & 2 \\ 3 & -1 & +3 & 3 & -1 \\ 2 & -4 & 6 & 2 & -4 \end{array}$$

$$6 + 18 - 27 - (6 - 12 + 36)$$

$$-9 + 30$$

$$21$$

(B)

↳ Possível Determinado