

Boating Gonçalves Eletrônicos

Sistema Linear

$$1) \mathcal{D} = \begin{pmatrix} 2 & 4 \\ 1 & 2 \end{pmatrix} = 2z$$

$$\mathcal{D}_x = \begin{pmatrix} 1 & 4 \\ b & 2 \end{pmatrix} = 2 \quad \mathcal{D}_x = \frac{2}{2z} = \frac{1}{z} \quad (B)$$

$$\mathcal{D}_y = \begin{pmatrix} 2 & 1 \\ 1 & b \end{pmatrix} = z \cdot b \quad \mathcal{D}_y = \frac{zb}{2z} \Rightarrow \frac{b}{2}$$

$$2) \mathcal{D} = \begin{pmatrix} 1 & k \\ k & 1 \end{pmatrix} = 1$$

$$\mathcal{D}_x = \begin{pmatrix} 1 & k \\ 1-k & 1 \end{pmatrix} = 1 \quad \mathcal{D}_x = \frac{1}{1} = 1 \quad (C)$$

$$\mathcal{D}_y = \begin{pmatrix} 1 & 1 \\ k & 1-k \end{pmatrix} = 1 - k \quad \mathcal{D}_y = \frac{1-k}{1} = 1 - k$$

$$3) \left[\begin{array}{ccc|cc} 1 & 2 & c & 1 & 2 \\ 0 & 1 & 1 & 0 & 1 \\ 3 & 2 & 2 & 3 & 2 \end{array} \right] \left. \begin{array}{l} 3c + 2 + 0 = 3c + 2 \\ 2 + 6 + 0 = 8 \end{array} \right\} \text{det } A = 8 - 2 - 3c = 6 - 3c$$

$$b - 6 - 3c = 0$$

$$3c = 6$$

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



$$4) \left[\begin{array}{ccc|cc} 1 & -1 & 0 & 1 & -3 \\ 12 & -k & 1 & 12 & -k \\ 36 & 0 & k & 36 & 0 \end{array} \right] \quad \left. \begin{array}{l} 0 \quad 0 \quad -32k = -32k \\ -k^2 - 36 + 12k \\ -k^2 - 36 \quad 0 = -k^2 - 36 \end{array} \right\}$$

$-k^2 - 36 + 12k$

$$\Delta = 32^2 - 4 \cdot -3 = 36$$

$$-k^2 + 12k - 36 = 0$$

$$\Delta = 144 - 144$$

$$\Delta = 0$$

$$k = \frac{-32 \pm \sqrt{0}}{2 \cdot -3} \Rightarrow \frac{-32}{-6} \Rightarrow \boxed{6} \quad (E)$$

$$5) \left[\begin{array}{ccc|cc} 1 & -2 & 2 & 17 & \\ 1 & -1 & 1 & 1 & -5 \\ 2 & 1 & -1 & 2 & 0 \\ 1 & 2 & -1 & 1 & 2 \end{array} \right] \quad \left. \begin{array}{l} 1 - 2 = 17 \\ 4 - 1 = 3 \\ -1 + 1 = 4 \end{array} \right\}$$

$$D_x = \left[\begin{array}{ccc|cc} 6 & -1 & 1 & 6 & -1 \\ -3 & 1 & -1 & -3 & 1 \\ -3 & 2 & -1 & -3 & 2 \\ -6 & -5 & -6 & -14 & \end{array} \right] \quad \left. \begin{array}{l} -5 - 12 - 3 = -20 \\ -1 \cdot -(-20) = 3 \end{array} \right\} \quad D_x = \frac{3}{-3} = 1$$

$$D_y = \left[\begin{array}{ccc|cc} 1 & 6 & 1 & 3 & 6 \\ 2 & -3 & -1 & 2 & -3 \\ 1 & -5 & -5 & 1 & -5 \\ 3 & -6 & -50 & -13 & \end{array} \right] \quad \left. \begin{array}{l} -3 + 5 - 12 = -10 \\ -13 - (-50) = 37 \end{array} \right\} \quad D_y = \frac{37}{3} = 1$$

$$D_{xy} = \left[\begin{array}{ccc|cc} 1 & -1 & 0 & 1 & -1 \\ 2 & 1 & -3 & 2 & 1 \\ 1 & 2 & -5 & 1 & 2 \\ -5 + 3 + 24 = 22 & & & & \end{array} \right] \quad \left. \begin{array}{l} 6 - 6 - 10 = -10 \\ 2 \cdot 2 - (-50) = 32 \end{array} \right\} \quad D_{xy} = \frac{32}{22} = \frac{2}{11}$$

$$6) \begin{bmatrix} 1 & 1 & x \\ K & 1 & 1 \\ 1 & 1 & -1 \end{bmatrix} \left. \begin{array}{l} 1+1-x=2-K \\ 1+1=2 \\ -1+1+K=K \end{array} \right\} \begin{array}{l} K-2+K=2K-2 \\ K=2 \Rightarrow K=-1 \end{array}$$

(D)

$$7) \begin{bmatrix} 1 & 1 & 1 \\ m-2 & 4 & m-2 \\ m^2-4 & 36 & m^2-4 \end{bmatrix} \left. \begin{array}{l} -2m^2+36+36m = -2m^2+36m+36 \\ -32+4m^2+4m = 4m^2+4m-32 \end{array} \right\} \begin{array}{l} 4m^2+4m-32+2m^2-36m-36 \\ 6m^2-32m-48=0 \end{array}$$

$$\Delta = (42)^2 - 4 \cdot 6 \cdot -48$$

$$\Delta = 144 + 1392$$

$$\Delta = 1528$$

(B)

$$m = \frac{12 \pm \sqrt{1528}}{2 \cdot 6}$$

$$m = \frac{12 \pm 36}{12} \quad \left[m_1 = \frac{12+36}{12} = \frac{48}{12} = 4 \right]$$

$$m_2 = \frac{12-36}{12} = \frac{-24}{12} = -2$$

Breitig Gonçalves Eletrica

Sistemas Lineares Inhomogêneos

$$1) \begin{pmatrix} 3 & 7 \\ 7 & 1 \end{pmatrix} = 1$$

$$Dx = \begin{pmatrix} K & 7 \\ K & 1 \end{pmatrix} = K$$

$$Dy = \begin{pmatrix} 7 & K \\ 1 & K \end{pmatrix} = 7K$$

$$\begin{array}{l} 2) \begin{pmatrix} 3 & 4 & -1 & | & 0 \end{pmatrix} \rightarrow \begin{pmatrix} 1 & 2 & 0 & | & 0 \end{pmatrix} \\ \rightarrow \begin{pmatrix} 2 & -1 & 3 & | & 0 \end{pmatrix} \rightarrow \begin{pmatrix} 0 & -3 & 0 & | & 0 \end{pmatrix} \rightarrow -3y = 0 \\ \rightarrow \boxed{y = 0} \end{array}$$

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

$$\boxed{y = 0}$$

$$x + y = 0$$

$$\boxed{x = 0}$$

(2)

3)

$$5) \left[\begin{array}{ccc|cc} -1 & +2 & -3 & -1 & 2 \\ 3 & -1 & 3 & 3 & -1 \\ 2 & -4 & 6 & 2 & -4 \end{array} \right] \quad \left. \begin{array}{l} 6+12+36=54 \\ D = 54 - 54 = [0] \end{array} \right\}$$

$6 + 12 + 30 = 54$

(B)