



**INSTITUTO FEDERAL**

São Paulo

Câmpus Cubatão

DOCENTE: LUCIANO ANDRE CARVALHO REIS

DISCENTE: GABRIEL ALVES DE OLIVEIRA

SALA: 317

## **MATEMATICA**

SEMANA 8

①

$$A = \begin{bmatrix} x & 1 \\ 5 & 3 \end{bmatrix} \text{ inverso } B = \begin{bmatrix} 3 & -1 \\ y & 2 \end{bmatrix}$$

$$\begin{bmatrix} x & 1 \\ 5 & 3 \end{bmatrix} \cdot \begin{bmatrix} 3 & -1 \\ y & 2 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 3x+y & -x+2 \\ 15+3y & 5+6 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$3x+y = 1 \quad -x+2 = 0 \quad 15+3y = 0 \quad 5+6 = 1$$

$$3y = -15 \quad y = -5$$

$$3x + y = 1$$

$$3x - 5 = 1$$

$$x = 2$$

$$x + y$$

$$2 + (-5)$$

$$-3$$

$$R: (C)$$

②

$$A = \begin{bmatrix} 1 & 0 & 1 \\ K & 1 & 3 \\ 1 & K & 3 \end{bmatrix}$$

$$D = \begin{bmatrix} 1 & 0 & 1 & 1+3K \\ K & 1 & 3 & K \\ 1 & K & 3 & 1+K^2 \end{bmatrix}$$

$$D = 3+K^2-1-3K$$

$$K^2-3K+2$$

$$\Delta = (3)^2 - 4 \cdot 1 \cdot 2$$

$$\Delta = 9 - 8$$

$$\Delta = 1$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a}$$

$$2 \cdot 1$$

$$x = \frac{3 \pm 1}{2}$$

$$x + \frac{4}{2} = 2$$

$$x = \frac{2-4}{2} = -1$$

$$R: (C)$$

$$③ \quad A = \begin{bmatrix} 3 & 5 \\ 2 & 4 \end{bmatrix} \quad A' = P$$

$$D = \begin{vmatrix} 3 & 5 \\ 2 & 4 \end{vmatrix} \quad D = 12 - 10 = 2$$

$$A^{-1} = \begin{bmatrix} \frac{4}{2} & -\frac{5}{2} \\ -\frac{2}{2} & \frac{3}{2} \end{bmatrix} = \begin{bmatrix} 2 & -\frac{5}{2} \\ -1 & \frac{3}{2} \end{bmatrix}$$

$R: (C)$

$$④ \quad \begin{bmatrix} X & 1 & 2 \\ 3 & 1 & 2 \\ 10 & 1 & X \end{bmatrix} \quad D = \begin{vmatrix} X & 1 & 2 \\ 3 & 1 & 2 \\ 10 & 1 & X \end{vmatrix} \quad \begin{cases} 10 + 2X + 3X - 10 \cdot 5X \\ D = X^2 + 16 - 10 \cdot 9X \\ X^2 - 5X + 6 \neq 0 \\ X^2 + 16 + 6 - X + 26 \end{cases}$$

$$\begin{aligned} \Delta &= (-5)^2 - 4 \cdot 1 \cdot 6 \\ \Delta &= 25 - 24 \\ \Delta &= 1 \end{aligned} \quad \begin{cases} X = \frac{-(-5) \pm \sqrt{1}}{2} \\ X = \frac{5 \pm 1}{2} = X_+ = \frac{6}{2} = 3 \\ X_- = \frac{4}{2} = 2 \end{cases}$$

$R: (A)$

$$⑤ \quad A = \begin{bmatrix} -1 & -1 & 2 \\ 2 & 1 & -2 \\ 1 & 1 & -1 \end{bmatrix} \quad D = \begin{vmatrix} -1 & -1 & 2 \\ 2 & 1 & -2 \\ 1 & 1 & -1 \end{vmatrix} \quad D = 7 - 6 = 1$$

$$A^{-1} = \begin{bmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix} \quad \text{Adj} = \begin{bmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix}$$

$$A^{-1} = \begin{bmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix} \quad \begin{bmatrix} -1 & -1 & 2 \\ 2 & 1 & -2 \\ 1 & 1 & -1 \end{bmatrix} \quad \begin{bmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix} \quad \begin{bmatrix} 0 & 0 & 2 \\ 2 & 0 & 0 \\ 2 & 1 & 0 \end{bmatrix}$$

$R: (B)$

~~Obs não mostra o exercício 6, e está com a resposta do exercício 5~~

$$\begin{aligned} (X \cdot A)^t &= B \\ X \cdot A &= B^t \\ X &= \frac{B^t}{A} \Rightarrow X = B^t \cdot A^{-1} \end{aligned}$$

$R: (B)$

$$\textcircled{7} \quad B = \begin{bmatrix} x \\ y \end{bmatrix} \quad C = \begin{bmatrix} 4x + 5y \\ 5x + 6y \end{bmatrix}$$

$$A = \begin{bmatrix} 4 & 5 \\ 5 & 6 \end{bmatrix}, B = \begin{bmatrix} x \\ y \end{bmatrix} \quad C = \begin{bmatrix} 4x + 5y \\ 5x + 6y \end{bmatrix}$$

$$D = 24 - 25 = -1$$

$$A^{-1} = \begin{bmatrix} \frac{6}{-1} & \frac{-5}{-1} \\ \frac{-5}{-1} & \frac{4}{-1} \end{bmatrix} = \begin{bmatrix} -6 & 5 \\ 5 & -4 \end{bmatrix}$$

$R: (D)$

$$\textcircled{8} \quad A = \begin{bmatrix} 2 & K \\ -2 & 1 \end{bmatrix} \quad D = 2K + 2 \quad \left\{ \begin{array}{l} 2K_1 + 2 = 1 \\ 2K_1 = -1 \\ K_1 = \frac{-1}{2} \end{array} \right. \quad \left\{ \begin{array}{l} 2K_2 + 2 = -1 \\ 2K_2 = -3 \\ K_2 = \frac{-3}{2} \end{array} \right.$$

$$\frac{-1}{2} + \left( \frac{-3}{2} \right) = \frac{-4}{2} = -2$$

$R: (B)$

$$\textcircled{9} \quad a) (A+B) \cdot (A-B) = A^2 - AB + BA - B^2$$

$$b) AB = BA$$

$$c) \frac{\det A}{\det A^{-1}} = \frac{\det A}{\left( \frac{1}{\det A} \right)} \rightarrow 1$$

$$d) B = A^{-1} \rightarrow B = \frac{1}{\det A}$$