

Julio Brandasse de Abreu Lima CTII 350 – Atividade de calculo geral de determinantes.

1) (Fubest)

$$A = \begin{bmatrix} 1 & \infty & 0 \\ 0 & 1 & 1 \\ 0 & -1 & 1 \end{bmatrix} \xrightarrow{1. \text{ cof } \text{col } 1} \begin{bmatrix} 1 & 1 \\ -2 & 1 \end{bmatrix} \rightarrow 1 - (-1) = 2$$

$\det A = 2$

2. cof (b₂₂)

$$B = \begin{bmatrix} 1 & 0 & 0 & 3 \\ \alpha & 1 & 1 & 4 \\ 0 & 0 & 0 & 3 \\ 0 & 1 & 1 & 4 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & -1 & 4 \\ 0 & 0 & 3 \\ 1 & 1 & 4 \end{bmatrix} \begin{matrix} 1 & -1 \\ 0 & 0 \\ 1 & 1 \end{matrix}$$

I $0 + 3 + 0 = 3$
 II $0 - 3 + 0 = -3$
 I + II $= 3 - 3 = 0$

$\alpha \cdot \text{cof } (b_{21})$

$$\begin{bmatrix} 0 & 0 & 3 & 0 \\ 0 & 0 & 3 & 0 \\ 1 & 1 & 4 & 1 \end{bmatrix} \begin{matrix} 0 & 0 \\ 0 & 0 \\ 1 & 1 \end{matrix}$$

I $0 + 0 + 0 + 0 = 0$
 II $0 + 0 + 0 + 0 = 0$
 I + II $= 0 - 0 = 0$

$\det B = -6$

R. $\det A = 2$
 $\det B = -6$

det B = -6

2)
$$\begin{vmatrix} x^2 & 0 & x & -\frac{1}{10} \\ 7,5 & 0 & 5 & 2 \\ 10 & 0 & 0 & 2 \\ 1 & 1 & 1 & 1 \end{vmatrix} = 0$$

1. cof(0₄₂)

$$\begin{vmatrix} x^2 & x & -\frac{1}{10} \\ 7,5 & 5 & 2 \\ 10 & 0 & 2 \end{vmatrix} \begin{vmatrix} x^2 & x \\ 7,5 & 5 \\ 10 & 0 \end{vmatrix}$$

$(-8x^2 + 15x - 25/10) \cdot (10x^2 + 20x - 30/10)$

$0 = (-8x^2 + 15x - 5) \cdot (10x^2 + 20x - 3) = 0$

$10x^2 + 20x - 3 - 8x^2 - 15x + 5 = 0$

$2x^2 + 5x + 2 = 0$

continue →
credeal

$b^2 - 4 \cdot a \cdot c \rightarrow 5^2 - 4 \cdot 2 \cdot 2 \rightarrow 25 - 16 \rightarrow \Delta = 9$

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

$x_1 = \frac{-5 + 3}{4} = -\frac{1}{2}$

$x_{II} = \frac{-5 - 3}{4} = -2$

$x = \{-1/2 \text{ ou } x = -2\}$

R: $x = -1/2$ ou $x = -2$

$$3) \begin{bmatrix} x & 0 & 0 & 3 \\ 1 & x & 0 & 0 \\ 0 & -1 & x & 1 \\ 0 & 0 & -1 & 2 \end{bmatrix} \cdot x$$

$$* x \cdot \text{cof}(a_{11}) *$$

$$\left\{ \begin{array}{l} \begin{bmatrix} x & 0 & 0 \\ 1 & x & 1 \\ 0 & -1 & -2 \end{bmatrix} \cdot x \cdot 0 \\ \begin{bmatrix} -1 & x \\ 0 & -1 \end{bmatrix} \cdot x \end{array} \right\} \begin{array}{l} I (-2x^2 + 0 + 0) \\ II (0 - x + 0) \end{array}$$

$$I + II = -2x^2 - (-x) = x \cdot (-2x^2 + x) \Rightarrow -2x^3 + x^2$$

$$\rightarrow x \cdot (-2)$$

$$* -1 \cdot \text{cof}(a_{21}) *$$

$$\begin{bmatrix} 0 & 0 & 3 \\ -1 & x & 1 \\ 0 & -1 & -2 \end{bmatrix} \begin{array}{l} 0 \cdot 0 \\ -1 \cdot x \\ 0 \cdot -1 \end{array}$$

$$I (0 + 0 + 3) \quad \text{De } 1+1 \\ \rightarrow 1+1 = 2+1 = (3) \text{ ímpar}$$

$$II (0 + 0 + 0)$$

$$\rightarrow -1 \cdot (-3) = 3 //$$

$$\text{Det} = -2x^3 + x^2 + 3 //$$

Letra (A) //

4)

$$\begin{bmatrix} x & 1 & 0 & 0 & 0 \\ 0 & x & 1 & 0 & 0 \\ 0 & 0 & x & 1 & 0 \\ 0 & 0 & 0 & x & k \\ 0 & 0 & 0 & 1 & x \end{bmatrix}$$

$\neq \text{imp} : p(x) = \det A$
 $p(-2) = 8$

$x \cdot \det \begin{bmatrix} x & 1 & 0 & 0 \\ 0 & x & 1 & 0 \\ 0 & 0 & x & k \\ 0 & 0 & 1 & x \end{bmatrix}$

$x \cdot \left(x \cdot \begin{bmatrix} x & 1 & 0 \\ 0 & x & k \\ 0 & 1 & x \end{bmatrix} \cdot x \cdot 1 \right)$

$\begin{matrix} \text{I} = 0 + xk + 0 \\ \text{II} = x^3 + 0 + 0 \end{matrix} \left. \vphantom{\begin{matrix} \text{I} \\ \text{II} \end{matrix}} \right\} x^3 - xk$

credeal

$x \cdot (x \cdot (x^3 - xk))$

\downarrow

$x^2 \cdot (x^3 - xk)$

$[x^5 - x^3 k] \rightarrow \det A$

$p(-2) = 8$
 $p(x) = \det A$
 $p(-2) = (-2)^5 - (-2)^3 k = 8$

$-32 + 8k = 8$
 $8k = 8 + 32$
 $k = 40$
 8
 $k = 5$

Letra
 (D)