2 Determinantes - cálculo geral

01- $A = \begin{vmatrix} 1 & a & 0 \\ 0 & 1 & 1 \\ 0 & -1 & 1 \end{vmatrix}$

$0 \quad -1 \quad 0 = -1$

$1 \quad 0 \quad 0 = 1$

$det A = 1 - (-1) = 2$

$B = \begin{vmatrix} 1 & 0 & 0 & 3 \\ a & 1 & -1 & 4 \\ 0 & 0 & 0 & 3 \\ 0 & 1 & 1 & 4 \end{vmatrix}$

1. cof (a_{22}) =

$$\begin{vmatrix} 1 & 0 & 3 \\ 0 & 0 & 3 \\ 0 & 1 & 4 \end{vmatrix}$$

0 3 0 3

1 0 1 0

0 0 0 0

→ 0 − 3 = −3

0 0 0 = 0

1. cof (a_{42}) =

$$\begin{vmatrix} 1 & 0 & 3 \\ a & -1 & 4 \\ 0 & 0 & 3 \end{vmatrix}$$

0 0 0 = 0

1 0 a −1 0 0

→ −3 − 0 = −3

−3 0 0 = −3

$\det B = -3 + (-3) = \underline{-6}$ //

02 −

$$\begin{vmatrix} x^2 & 0 & x & \frac{-1}{10} \\ 7{,}5 & 0 & 5 & 2 \\ 10 & 0 & 4 & 2 \\ 1 & 1 & 1 & 1 \end{vmatrix} = 0$$

1. cof (a_{42}) =

$$\begin{vmatrix} x^2 & x & \frac{-1}{10} \\ 7{,}5 & 5 & 2 \\ 10 & 4 & 2 \end{vmatrix}$$

x^2 x

7,5 5

10 4

−5 $8x^2$ 15x

$10x^2$ 20x −3

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

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

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

$\Delta = 25 - 4 \cdot 2 \cdot 2$

$\Delta = 25 - 16 = 9$

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

$x_2 = \frac{-5 - 3}{4} = \frac{-8}{4} = \underline{-2}$ //

03- $\begin{vmatrix} x & 0 & 0 & 3 \\ -1 & x & 0 & 0 \\ 0 & -1 & x & 1 \\ 0 & 0 & -1 & -2 \end{vmatrix}$

$x \cdot cof(a_{22}) = \begin{vmatrix} x & 0 & 3 \\ -1 & x & 0 \\ 0 & 0 & -2 \end{vmatrix}$ → $\begin{matrix} x & 0 \\ -1 & x \\ 0 & 0 \end{matrix}$ → $-2x^2 - 0 = -2x^2$

$-2x^2 \cdot x = -2x^3$ $\quad -2x^2\ 0\ 0 = -2x^2$

$-1 \cdot cof(a_{43}) = \begin{vmatrix} x & 0 & 3 \\ -1 & x & 0 \\ 0 & -1 & 1 \end{vmatrix}$ → $\begin{matrix} x & 0 \\ -1 & x \\ 0 & -1 \end{matrix}$ → $x^2 + 3 - 0 = x^2 + 3$

$x^2\ 0\ 3 = x^2 + 3$

$\det = -2x^3 + x^2 + 3$

(A)

04) $\begin{vmatrix} -2 & 1 & 0 & 0 & 0 \\ 0 & -2 & 1 & 0 & 0 \\ 0 & 0 & -2 & 1 & 0 \\ 0 & 0 & 0 & -2 & K \\ 0 & 0 & 0 & 0 & -2 \end{vmatrix} = 8$

$f(x) = \det A$

$f(-2) = 8$

$-2 \cdot cof(a_{11}) = \begin{vmatrix} -2 & 1 & 0 & 0 \\ 0 & -2 & 1 & 0 \\ 0 & 0 & -2 & K \\ 0 & 0 & 1 & -2 \end{vmatrix}$

$-2 \cdot (16 - 4K) = 8$

$-32 + 8K = 8$

$K = 40/8 = 5$

$-2 \cdot cof(a_{11}) = \begin{vmatrix} -2 & 1 & 0 \\ 0 & -2 & K \\ 0 & 1 & -2 \end{vmatrix}$ → $\begin{matrix} -2 & 1 \\ 0 & -2 \\ 0 & 1 \end{matrix}$

$-2K\ 0 = -2K$

$-8 - (-2K) = -8 + 2K$

$-2 \cdot (-8 + 2K)$

$-8\ 0\ 0 = -8$ $\quad 16 - 4K$