

## Determinantes - Cálculo Geral - Tarefa Básica

### Exercício 1

01. (FUVEST) Calcule os determinantes:

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

$$A = \begin{vmatrix} 1 & a & 0 \\ 0 & 1 & 1 \\ 0 & -1 & 1 \end{vmatrix} \quad 1. \text{ Col}(a_{11})$$

$$\begin{vmatrix} 1 & 1 \\ -1 & 1 \end{vmatrix} = 1 - (-1) = 2 //$$

$$B = \begin{vmatrix} 1 & 0 & 0 & 3 \\ a & 1 & -1 & 4 \\ 0 & 0 & 0 & 3 \\ 0 & 1 & 1 & 4 \end{vmatrix} \quad 1. \text{ Col}(a_{22})$$

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

$$0 + 0 + 0 = 0$$

$$0 + 3 + 0 = 3$$

$$1. \text{ Col}(a_{42})$$

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

$$-3 + 0 + 0 = -3$$

$$0 + 0 + 0 = 0$$

$$\text{Det} = (-3) + (-3) = -6 //$$

## Exercício 2

02. (FATEC) Calcule  $x$  na equação

$x^2$	0	$x$	$-\frac{1}{10}$
7,5	0	5	2
10	0	4	2
1	1	1	1

 $= 0$

1 col (a42)

$x^2$	$x$	$-\frac{1}{10}$
7,5	5	2
10	4	2

$$\begin{aligned} &10x^2 + 10x - 3 \\ &-5 + 8x + 15x \end{aligned}$$

$$\begin{aligned} &(10x^2 + 10x - 3) - (-5 + 8x + 15x) \\ &10x^2 + 10x - 3 + 5 - 8x - 15x \\ &2x^2 + 5x + 2 = 0 \end{aligned}$$

$$\Delta = (-5)^2 - 4 \cdot (2) \cdot 2$$

$$\Delta = 25 - 16$$

$$\Delta = 9$$

$$\frac{-5 \pm 3}{4} \begin{cases} x_1 = -\frac{1}{2} \\ x_2 = -2 \end{cases}$$

Resposta  $x = -2$  ou  $-\frac{1}{2}$

### Exercício 3

03. (PUCSP) O determinante

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

representa o polinômio

x col (a<sub>11</sub>)

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

$$-2x^2 + 0 + 0 = -2x^2$$

$$0 + -x = -x$$

-1 col (21)

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

$$0 + 0 + 3 = 3$$

$$0 + 0 + 0 = 0$$

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

Resposta A



#### Exercício 4

04. (UFSCAR) Sejam a matriz  $A$  e a função  $f: \mathbb{R} \rightarrow \mathbb{R}$  int $\tilde{a}$   $K$ .  
vale

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

$$\text{Det} = x^3 \cdot (x^2 - k)$$

$$8 = (-2)^3 \cdot (-2)^2 - k$$

$$8 = -8 \cdot (4 - k)$$

$$-1 = 4 - k$$

$$\boxed{k = 5}$$