

Lista 1: Matrizes

1) Determine a matriz $A = (a_{ij})_{3 \times 3}$ tal que $a_{ij} = i - j$.

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix} = \begin{bmatrix} 0 & -1 & -2 \\ 1 & 0 & -1 \\ 2 & 1 & 0 \end{bmatrix}$$

$$\begin{array}{l|l|l} a_{11} = 1-1=0 & a_{22} = 2-2=0 & a_{32} = 3-2=1 \\ a_{12} = 1-2=-1 & a_{23} = 2-3=-1 & a_{33} = 3-3=0 \\ a_{13} = 1-3=-2 & a_{31} = 3-1=2 & \\ a_{21} = 2-1=1 & & \end{array}$$

2) Seja a matriz $A = (a_{ij})_{3 \times 4}$ tal que $a_{ij} = \begin{cases} i+j, & \text{se } i=j \\ 2i-2j, & \text{se } i \neq j \end{cases}$ então
 $a_{22} + a_{34}$ é igual a: $a_{22} = 2+2=4$ $a_{34} = 2 \cdot 3 - 2 \cdot 4 = 6 - 8 = -2$
 $4 - 2 = 2$

3) Determine a e b para que a igualdade $\begin{pmatrix} a+4 & b^3 \\ 10 & 7 \end{pmatrix} = \begin{pmatrix} 2a & b \\ 10 & 7 \end{pmatrix}$ seja verdadeira.

$$\begin{array}{l|l} a+4=2a & b^3=b \\ a-2a=4 & b^3-b=0 \\ -a=4 & b(b^2-1)=0 \\ \underline{a=-4} & b=0 \text{ ou } b^2-1=0 \\ & b^2=1 \\ & b=\pm\sqrt{1}=\pm 1 \end{array}$$

4) Dadas as matrizes $A = \begin{bmatrix} 0 & 3 \\ 2 & -5 \end{bmatrix}$, $B = \begin{bmatrix} -2 & 4 \\ 0 & -1 \end{bmatrix}$ e $C = \begin{bmatrix} 4 & 2 \\ -6 & 0 \end{bmatrix}$, calcule:

a) $A + B$

$$\begin{bmatrix} -2 & 7 \\ 2 & -6 \end{bmatrix}$$

b) $A + C$

$$\begin{bmatrix} 4 & 5 \\ -4 & -5 \end{bmatrix}$$

c) $A + B + C$

$$\begin{bmatrix} 2 & 9 \\ -4 & -6 \end{bmatrix}$$

