

departamento de matemática



universidade de aveiro

1. Calcule:

$$(a) \ 3 \left(\begin{bmatrix} 1 & 3 & 2 \\ 0 & 4 & -9 \\ 2 & -3 & 1 \end{bmatrix} - 2 \begin{bmatrix} 2 & 0 & 1 \\ -5 & -3 & 2 \\ 2 & -8 & -3 \end{bmatrix} \right) + 5 \begin{bmatrix} 1 & -5 & 3 \\ 0 & -7 & 0 \\ 2 & 4 & -4 \end{bmatrix}^T;$$

$$(b) \ \begin{bmatrix} 2 & 0 & -2 \\ 6 & 1 & 4 \\ 4 & 3 & -3 \end{bmatrix} - \left(2 \begin{bmatrix} 0 & -4 & 0 \\ -2 & 2 & 7 \\ 5 & 2 & 9 \end{bmatrix} - \begin{bmatrix} 1 & -5 & 8 \\ 7 & 4 & 1 \\ 8 & 5 & 2 \end{bmatrix} \right)^T.$$

2. Encontre os valores de a , de b , de c e de d , sabendo que:

$$(a) \ \begin{bmatrix} a & b \\ c & d \end{bmatrix} = \begin{bmatrix} b-c & c \\ d & 1 \end{bmatrix}; \quad (b) \ 3 \begin{bmatrix} a \\ b \end{bmatrix} - 2 \begin{bmatrix} b \\ 0 \end{bmatrix} = \begin{bmatrix} 1 \\ 4 \end{bmatrix}.$$

3. Em cada caso, encontre a matriz A tal que:

$$(a) \ 2A - \begin{bmatrix} 1 & 0 & -2 \\ 4 & 7 & 3 \end{bmatrix}^T = \begin{bmatrix} 2 & 0 \\ -3 & 4 \\ 0 & 8 \end{bmatrix};$$

$$(b) \ \left(3A^T - 2 \begin{bmatrix} 0 & 2 \\ -5 & 2 \\ 1 & 3 \end{bmatrix} \right)^T = \begin{bmatrix} 7 & 0 & -1 \\ 2 & 1 & 5 \end{bmatrix}.$$

4. Simplifique as seguintes expressões matriciais:

$$(a) \ 3(5A - 3B) + 6(B - 4A) + 3(2A + B);$$

$$(b) \ 2(3B - 5A) + 4(A - 2B) + 2(3A - B).$$

$$1. \text{ (a) } \begin{bmatrix} -4 & 9 & 10 \\ 5 & -5 & -19 \\ 9 & 39 & 1 \end{bmatrix}; \quad \text{(b) } \begin{bmatrix} 3 & 11 & -4 \\ 9 & 1 & 5 \\ 12 & -10 & -19 \end{bmatrix}.$$

$$2. \text{ (a) } a = 0 \text{ e } b = c = d = 1; \quad \text{(b) } a = \frac{11}{9} \text{ e } b = \frac{4}{3}.$$

$$3. \text{ (a) } \begin{bmatrix} \frac{3}{2} & 2 \\ -\frac{3}{2} & \frac{11}{2} \\ -1 & \frac{11}{2} \end{bmatrix}; \quad \text{(b) } \begin{bmatrix} \frac{7}{3} & -\frac{10}{3} & \frac{1}{3} \\ 2 & \frac{5}{3} & \frac{11}{3} \end{bmatrix}.$$

$$4. \text{ (a) } -3A; \quad \text{(b) } -4B.$$