



Exercícios: Operações com matrizes

Dadas as matrizes $A = \begin{pmatrix} 3 & 2 \\ -1 & 4 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 3 \\ 2 & -2 \end{pmatrix}$ e $C = \begin{pmatrix} 0 & 2 \\ 5 & 8 \end{pmatrix}$, calcule, se existir:

1. $A + B =$

2. $B + C =$

3. $C - A =$

Dadas as matrizes $A = \begin{pmatrix} 1 & 1 & 1 \\ 2 & 3 & 4 \end{pmatrix}$ e $B = \begin{pmatrix} 1 & 2 \\ 2 & 1 \\ 3 & 3 \end{pmatrix}$,

calcule, se existir:

4. $A + B =$

5. $A^t + B =$

6. $A + B^t =$

Dadas as matrizes: $A = \begin{pmatrix} 3 & 1 & 3 \\ 2 & 4 & 2 \end{pmatrix}$ e $B = \begin{pmatrix} -1 & 2 & 0 \\ 4 & -2 & 1 \end{pmatrix}$, determine a matriz X nos casos a seguir, sendo:

7. $X + B = A$

8. $X + A^t = B^t$

9. $X + A + B = 0$

10. Dadas as matrizes: $A = \begin{bmatrix} 3 & 1 \\ 2 & 7 \end{bmatrix}$ e $B = \begin{bmatrix} -1 & \frac{1}{2} \\ \frac{1}{2} & 2 \end{bmatrix}$, determine a matriz X e Y para:

$$\begin{cases} X + A^t = B \\ Y - X = B^t \end{cases}$$

11. Dada $A = \begin{bmatrix} 2 & 1 & 1 \\ -1 & 3 & 1 \\ -1 & -1 & 4 \end{bmatrix}$, calcule a matriz:

$$5(2A)^t - 3(-A).$$

12. Resolva a equação $2A - 5X = B^t$, sendo dadas as matrizes $A = \begin{pmatrix} 1 & 1 \\ 1 & 9 \end{pmatrix}$ e $B = \begin{pmatrix} 1 & 2 \\ -2 & 0 \end{pmatrix}$.

Gabarito:

1. $A + B = \begin{bmatrix} 4 & 5 \\ 1 & 2 \end{bmatrix}$
 2. $B + C = \begin{bmatrix} 1 & 5 \\ 7 & 6 \end{bmatrix}$
 3. $C - A = \begin{bmatrix} -3 & 0 \\ 6 & 4 \end{bmatrix}$
 4. $A + B = \cancel{A}$

5. $A^t + B = \begin{bmatrix} 2 & 4 \\ 3 & 4 \\ 4 & 7 \end{bmatrix}$
 6. $A + B^t = \begin{bmatrix} 2 & 3 & 4 \\ 4 & 4 & 7 \end{bmatrix}$
 7. $X = \begin{bmatrix} 4 & -1 & 3 \\ -2 & 6 & 1 \end{bmatrix}$
 8. $X = \begin{bmatrix} -4 & 2 \\ 1 & -6 \\ -3 & -1 \end{bmatrix}$
 9. $X = \begin{bmatrix} -2 & -3 & -3 \\ -6 & -2 & -3 \end{bmatrix}$

10. $X = \begin{pmatrix} -4 & -\frac{3}{2} \\ -\frac{1}{2} & -5 \end{pmatrix}$
 e $Y = \begin{pmatrix} -5 & -1 \\ 0 & -3 \end{pmatrix}$
 11. $\begin{bmatrix} 26 & -7 & -7 \\ 7 & 39 & -7 \\ 7 & 7 & 52 \end{bmatrix}$
 12. $X = \begin{pmatrix} \frac{1}{5} & \frac{4}{5} \\ 0 & \frac{18}{5} \end{pmatrix}$