PB2.1 Considere as matrizes

$$\mathbf{A}_\alpha = \begin{bmatrix} 0 & 0 & 2\alpha - 2 \\ 1 & 2 & 1 \\ 3 & 6 & 3 \\ \alpha & 2 & 1 \end{bmatrix} \quad \text{e} \quad \mathbf{b}_{\alpha,\beta} = \begin{bmatrix} 2\alpha - \beta \\ 1 + \beta \\ 9 \\ 3 \end{bmatrix}.$$

Determine o conjunto S das soluções do sistema $\mathbf{A}_\alpha \mathbf{x} = \mathbf{b}_{\alpha,\beta}$ para cada valor dos parâmetros α e β.

PB2.2 Considere as matrizes

$$\mathbf{A} = \begin{bmatrix} 1 & -2 & -2 \\ 0 & 1 & -1 \\ -1 & 2 & 3 \end{bmatrix} \text{ e } \mathbf{B} = \begin{bmatrix} 5 & 2 & 4 \\ 1 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix},$$

Calcule as matrizes $\mathbf{B^{-1}A^{-1}}$ e $(\mathbf{AB^{-1}})^{\mathbf{-1}}\mathbf{A}^2$

PB2.3 Considere as matrizes $\mathbf{A}$ e $\mathbf{B}$, definidas pelas igualdades

$$\mathbf{A} = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 1 \\ 0 & 0 & 1 \end{bmatrix} \quad e \quad \mathbf{B} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}.$$

Determine uma matriz $\mathbf{X}$ tal que:

a) $\mathbf{A}^{-1}\mathbf{X} = \mathbf{B} + 3\mathbf{A}^{-1}$.

b) $\mathbf{BX} = \mathbf{A}$.