

Risolvere i seguenti sistemi lineari:

$$\begin{cases} x + y + z = 0 \\ x + y + 3z = 2 \\ 2x + y + z = 1 \\ 3x + 2y + 3z = 2 \end{cases} \quad \text{Sol : } x = 1, y = -2, z = 1$$

$$\begin{cases} x + \frac{3}{4}y + z = 1 \\ x + y + 3z = 2 \\ 2x + \frac{3}{4}y + z = 1 \\ 3x + \frac{3}{2}y + 3z = 2 \end{cases} \quad \text{Sol : impossibile}$$

$$\begin{cases} x + y + z = 2 \\ x + y + 3z = 0 \\ 2x + y - z = 1 \end{cases} \quad \text{Sol : } x = -3, y = 6, z = -1$$

$$\begin{cases} x + y + 2z = 2 \\ x + y + 3z = 1 \\ 2x + 2y - z = 1 \end{cases} \quad \text{Sol : impossibile}$$

$$\begin{cases} x + y + 3z = 2 \\ x + y + 3z = 2 \\ 2x + 3y - z = 1 \end{cases} \quad \text{Sol : } x = 5 - 10t, y = 7t - 3, z = t$$

$$\begin{cases} x - 2y - z = 0 \\ -x - y - w = 1 \\ -y - z - 2w = 0 \\ -x - y + z = 1 \end{cases} \quad \text{Sol : } x = -1, y = -\frac{1}{3}, z = -\frac{1}{3}, w = \frac{1}{3}$$

$$\begin{cases} 2x - 2y - z + 2 = 3 \\ -2x = 1 \\ x + 2y + z + 2w = 3 \\ x - 2y - z + w = 0 \end{cases} \quad \text{Sol : impossibile}$$

$$\begin{cases} 2x - 2y - z + 2 = 0 \\ -2x = 0 \\ x + 2y + z + 2w = 0 \\ x - 2y - z + w = 0 \end{cases} \quad \text{Sol : } x = 0, y = t, z = -2t, w = 0$$

Calcolare gli autovalori delle seguenti matrici:

$$\begin{pmatrix} -1 & -2 & 0 \\ -2 & 2 & -2 \\ 0 & 0 & 1 \end{pmatrix} \quad \text{Sol : } (3, -2, 1)$$

$$\begin{pmatrix} 1 & 3 & 0 \\ 2 & -3 & 0 \\ -5 & 0 & 2 \end{pmatrix} \quad \text{Sol : } (-1 - \sqrt{10}, -1 + \sqrt{10}, 2)$$

$$\begin{pmatrix} 4 & -4 & 4 \\ -1 & -5 & 4 \\ -1 & 4 & -5 \end{pmatrix} \quad \text{Sol : } (-9, 4, -1)$$

$$\begin{pmatrix} 0 & 0 & 1 \\ -1 & -2 & 1 \\ 1 & 0 & 1 \end{pmatrix} \quad \text{Sol : } \left(-2, \frac{1}{2}(1 + \sqrt{5}), \frac{1}{2}(1 - \sqrt{5})\right)$$