finiti i conti

$$N = \frac{1}{14}\begin{pmatrix} -4 & 23 \\ 22 & -25 \end{pmatrix}$$

$$M = \frac{1}{29}\begin{pmatrix} 25 & 23 \\ 22 & 4 \end{pmatrix}$$

$$\begin{array}{r} 22 \\ 23 \\ \hline 66 \\ 44 \\ \hline 506 \end{array}$$

$$M^{-1} = 29 \cdot \frac{1}{100 - 506}\begin{pmatrix} 4 & -23 \\ -22 & 25 \end{pmatrix}$$

$$= \frac{29}{-406}\begin{pmatrix} 4 & -23 \\ -22 & 25 \end{pmatrix} = \frac{1}{14}\begin{pmatrix} -4 & 23 \\ 22 & -25 \end{pmatrix} \checkmark$$

5.5.7 Verificare formula cambio base:

$$\{x \in \mathbb{R}^3 : 3x_1 - 2x_2 + 7x_3 = 0\}$$

$$\mathcal{B} = \left(\begin{pmatrix} -1 \\ 2 \\ 1 \end{pmatrix} \begin{pmatrix} 1 \\ 12 \\ 3 \end{pmatrix} \right) \qquad \mathcal{B}' = \left(\begin{pmatrix} 5 \\ 4 \\ -1 \end{pmatrix} \begin{pmatrix} -1 \\ 9 \\ 3 \end{pmatrix} \right) \qquad v = \begin{pmatrix} 3 \\ 1 \\ -1 \end{pmatrix}$$

$-3-3+7$ ↙ $\quad 3-24+21$ ✓ $\qquad 15-8-7$ ✓ $\quad -3-18-21$ ✓ $\qquad 9-2-7$ ✓

$$[v]_{\mathcal{B}}: \quad \begin{pmatrix} 3 \\ 1 \\ -1 \end{pmatrix} = -\frac{5}{2} \begin{pmatrix} -1 \\ 2 \\ 1 \end{pmatrix} + \frac{1}{2} \begin{pmatrix} 1 \\ 12 \\ 3 \end{pmatrix} \qquad [v]_{\mathcal{B}} = \frac{1}{2} \begin{pmatrix} -5 \\ 1 \end{pmatrix}$$

$$[v]_{\mathcal{B}'}: \quad \begin{pmatrix} 3 \\ 1 \\ -1 \end{pmatrix} = \frac{4}{7} \begin{pmatrix} 5 \\ 4 \\ -1 \end{pmatrix} - \frac{1}{7} \begin{pmatrix} -1 \\ 9 \\ 3 \end{pmatrix} \qquad [v]_{\mathcal{B}'} = \frac{1}{7} \begin{pmatrix} 4 \\ -1 \end{pmatrix}$$

Trovo M da B e B':

$$\begin{pmatrix} 5 \\ 4 \\ -1 \end{pmatrix} = -4 \begin{pmatrix} -1 \\ 2 \\ 1 \end{pmatrix} + 1 \begin{pmatrix} 1 \\ 12 \\ 3 \end{pmatrix} \qquad M = \frac{1}{2} \begin{pmatrix} -8 & 3 \\ 2 & 1 \end{pmatrix}$$

$$\begin{pmatrix} -1 \\ 9 \\ 3 \end{pmatrix} = \frac{3}{2} \begin{pmatrix} -1 \\ 2 \\ 1 \end{pmatrix} + \frac{1}{2} \begin{pmatrix} 1 \\ 12 \\ 3 \end{pmatrix}$$

$$M^{-1} = 2 \cdot \frac{1}{-8-6} \begin{pmatrix} 1 & -3 \\ -2 & -8 \end{pmatrix} = \frac{1}{7} \begin{pmatrix} -1 & 3 \\ 2 & 8 \end{pmatrix}$$

$$[v]_{B'} = M^{-1} \cdot [v]_B$$

$$\frac{1}{7} \begin{pmatrix} 4 \\ -1 \end{pmatrix} = \frac{1}{7} \begin{pmatrix} -1 & 3 \\ 2 & 8 \end{pmatrix} \cdot \frac{1}{2} \cdot \begin{pmatrix} -5 \\ 1 \end{pmatrix} = \frac{1}{7} \cdot \frac{1}{2} \cdot \begin{pmatrix} 8 \\ -2 \end{pmatrix} = \frac{1}{7} \begin{pmatrix} 4 \\ -1 \end{pmatrix}$$