25-10

$$\begin{cases} x - y = 0 \\ 2x + y - z = 1 \\ x + 2y + 2z \end{cases} \quad \begin{pmatrix} 1 & -1 & 0 \\ 2 & 1 & -1 \\ 1 & 2 & 2 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 0 \\ 1 \\ 2 \end{pmatrix}$$

$$R_{II} \to R_{II} - 2R_{I} = \left(2 \quad 1 \quad -1 \mid 1\right) - 2\left(1, -1, 0 \mid 0\right)$$

$$= \left(0, 3, -1 \mid 1\right) \quad \boxed{R_{II} \text{ NUOVA}}$$

$$R_{III} \to R_{III} - R_{I} = \left(1 \quad 2 \quad 2 \mid 2\right) - \left(1 \quad -1 \quad 0 \mid 0\right)$$

$$= \left(0 \quad 3 \quad 2 \mid 2\right) \quad \boxed{R_{III} \text{ NUOVA}}$$

$$R_{III} \to R_{III} - R_{II} = \left(0 \quad 3 \quad 2 \mid 2\right) - \left(0 \quad 3 \quad -1 \mid 1\right)$$

$$= \left(0 \quad 0 \quad 3 \mid 1\right)$$

IL SISTEMA DIVENTA:

$$\begin{cases} x - y = 0 \\ 3y - z = 1 \\ 3z = 1 \end{cases}$$

LA MATRICE SI TRASFORMA IN:

$$\begin{pmatrix} 1 & -1 & 0 \\ 0 & 3 & -1 \\ 0 & 0 & 3 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 0 \\ 1 \\ 1 \end{pmatrix} \quad w = \begin{pmatrix} x \\ y \\ z \end{pmatrix} \quad b = \begin{pmatrix} 0 \\ 1 \\ 1 \end{pmatrix}$$

$$A \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 0 \\ 1 \\ 1 \end{pmatrix} \rightsquigarrow \boxed{Aw = b}$$

A INVERTIBILE

SIGNIFICA

ESISTE A^{-1}

$$A^{-1} \cdot A = I = \begin{pmatrix} 1 & & 0 \\ & \ddots & \\ 0 & & 1 \end{pmatrix}$$

$$\begin{cases} Aw = b \\ 3(1) = 3(1) \end{cases}$$

$$A^{-1} \cdot (Aw) = A^{-1}(b)$$

$$A^{-1}\, 3(Aw) =$$

$$= A^{-1}(b)$$

$$(A^{-1} A) w = A^{-1} b$$

$$w = I \cdot w = A^{-1} b$$