$y_1 - y_2 = 0 \Rightarrow y_1 = y_2$

$\Rightarrow \operatorname{Im} f = \{ y \in \mathbb{R}^3 \mid y_1 = y_2 \} =$

$= \{ (y_1, y_1, y_3) \mid y \in \mathbb{R}^3 \}$

$= \{ y_1(1,1,0) + y_3(0,0,1) \mid y \in \mathbb{R}^3 \}$

6. $U = \{ x \in \mathbb{R}^3 \mid x_1 + x_2 + x_3 = 0 \}$

a) $x_1 + x_2 + x_3 = 0 \Leftrightarrow x_1 = -x_2 - x_3$

$U = \{ (-x_2 - x_3, x_2, x_3) \mid x_2, x_3 \in \mathbb{R} \}$

$U = \langle \{ (-1,1,0), (-1,0,1) \} \rangle$

$$C = \begin{pmatrix} -1 & -1 \\ 1 & 0 \\ 0 & 1 \end{pmatrix}$$

$\operatorname{rg} C = 2 = |U| \Rightarrow U$ este SLI

$|U| \neq \dim_{\mathbb{R}} \mathbb{R}^3 \Rightarrow U$ nu e bază

$\Rightarrow U$ nu este reper

$$C' = \begin{pmatrix} -1 & -1 & 1 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$$

$\det C' = 2 \neq 0 \Rightarrow \operatorname{rg} C' = 3 = \dim_{\mathbb{R}} \mathbb{R}^3$

$R = \{ (-1,1,0), (-1,0,1), (1,1,0) \}$ reper