

P1:
$$\left. \begin{aligned} x_1 - x_2 &= y_0 \\ -2x_2 + x_1 &= 14 \\ x_2 &= 0 \end{aligned} \right\} \Rightarrow \left. \begin{aligned} x_1 - x_2 - y_0 &= 0 \\ x_1 - 2x_2 + 0y_0 &= 14 \\ 0x_1 + x_2 + 0y_0 &= 0 \end{aligned} \right\}$$

$$\Rightarrow \boxed{\begin{bmatrix} 1 & -1 & -1 \\ 1 & -2 & 0 \\ 0 & 1 & 0 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ y_0 \end{bmatrix} = \begin{bmatrix} 0 \\ 14 \\ 0 \end{bmatrix}}$$

P2:
$$\begin{bmatrix} 1 & -2 & 1 \\ 1 & 1 & 0 \\ 2 & -4 & 2 \end{bmatrix}; D = 1(2 - (-4)) - (-2)(2 - 2) + 1(-4 - 2)$$

$$= 6 + \cancel{2(0)} + (-6) = 0; D = 0$$

\Rightarrow matrix a) is singular!