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Variante: 4

P3, (a) Solve the system $Aw = b$

where $w = (x, y, z)$, $A = \begin{bmatrix} 2 & 1 & -3 \\ 2 & 1 & 1 \\ 2 & 1 & -1 \end{bmatrix}$, $b = \begin{bmatrix} 4 \\ 4 \\ 4 \end{bmatrix}$

Answer:

$$\begin{bmatrix} 2 & 1 & -3 \\ 2 & 1 & 1 \\ 2 & 1 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 4 \\ 4 \\ 4 \end{bmatrix}$$

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 2 & 1 & -3 \\ 2 & 1 & 1 \\ 2 & 1 & -1 \end{bmatrix}^{-1} \begin{bmatrix} 4 \\ 4 \\ 4 \end{bmatrix}$$

the determinant
is 0 so the inverse
does not exist

$$\left[\begin{array}{ccc|c} 2 & 1 & -3 & 4 \\ 2 & 1 & 1 & 4 \\ 2 & 1 & -1 & 4 \end{array} \right] \Rightarrow \left[\begin{array}{ccc|c} 2 & 1 & -3 & 4 \\ 0 & 0 & 4 & 0 \\ 0 & 0 & 2 & 0 \end{array} \right]$$

there's no solution