

Paulina Piekarska EPM sem: 2 gr. 3

$$\begin{cases} x_1 + x_2 - x_3 = 1 \\ 2x_1 + 4x_3 = 2 \\ -x_1 + x_2 - 5x_3 = -1 \\ 3x_1 + x_2 + 3x_3 = 3 \end{cases}$$

$$\left[\begin{array}{ccc|c} 1 & 1 & -1 & 1 \\ 2 & 0 & 4 & 2 \\ -1 & 1 & -5 & -1 \\ 3 & 1 & 3 & 3 \end{array} \right] \xrightarrow{\Gamma_1 \rightarrow \Gamma_1 + \Gamma_2} \left[\begin{array}{ccc|c} 3 & 1 & 3 & 3 \\ 2 & 0 & 4 & 2 \\ -1 & 1 & -5 & -1 \\ 3 & 1 & 3 & 3 \end{array} \right] \xrightarrow{\Gamma_1 \leftrightarrow \Gamma_2}$$

We can cross-out one row cause it's the same like last one

y want to have 1 here

$$\left[\begin{array}{ccc|c} -1 & 1 & -5 & -1 \\ 2 & 0 & 4 & 2 \\ 3 & 1 & 3 & 3 \end{array} \right] \xrightarrow{\Gamma_1 \rightarrow \Gamma_1 + \Gamma_2} \left[\begin{array}{ccc|c} 1 & 1 & -1 & 1 \\ 2 & 0 & 4 & 2 \\ 3 & 1 & 3 & 3 \end{array} \right] \xrightarrow{\Gamma_3 \rightarrow \Gamma_3 - \Gamma_2}$$

y want 0 here

$$\left[\begin{array}{ccc|c} 1 & 1 & -1 & 1 \\ 2 & 0 & 4 & 2 \\ 1 & 1 & -1 & 1 \end{array} \right] \xrightarrow{\Gamma_2 \rightarrow \Gamma_2 \cdot (-\frac{1}{4})} \left[\begin{array}{ccc|c} 1 & 1 & -1 & 1 \\ -\frac{1}{2} & 0 & 1 & -\frac{1}{2} \\ 1 & 1 & -1 & 1 \end{array} \right] \xrightarrow{\Gamma_1 \rightarrow \Gamma_1 + \Gamma_2}$$

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

We can cross-out one row cause it's the same as the first one

$$\begin{cases} \frac{1}{2}x + y = \frac{1}{2} \\ -\frac{1}{2}x + z = -\frac{1}{2} \\ y = \frac{1}{2} - \frac{1}{2}x \\ z = -\frac{1}{2} + \frac{1}{2}x \end{cases}$$