

# REPETITION 01/09

## System of linear equations

$$\begin{aligned} 2x_2 + 6x_3 + 4x_4 &= -5 \\ 3x_1 - 7x_2 - 5x_3 + 8x_4 &= 9 \\ 3x_1 - 9x_2 - 9x_3 + 6x_4 &= 15 \end{aligned}$$



$$\left[ \begin{array}{cccc|c} 0 & 2 & 6 & 4 & -5 \\ 3 & -7 & -5 & 8 & 9 \\ 3 & -9 & -9 & 6 & 15 \end{array} \right]$$

augmented matrix

$$\sim \left[ \begin{array}{cccc|c} \boxed{1} & 0 & 0 & 2 & -5.5 \\ 0 & \boxed{1} & 0 & -1 & -4 \\ 0 & 0 & \boxed{1} & 1 & 0.5 \end{array} \right]$$

reduced echlon form

pivot elements



$$x_1 + 2x_4 = -5.5$$

$$x_2 - x_4 = -4$$

$$x_3 + x_4 = 0.5$$

$$x_1 = -5.5 - 2x_4$$

$$x_2 = -4 + x_4$$

$$x_3 = 0.5 - x_4$$

$x_4$  free variable

→ infinitely many solutions