Sebastian Miłkowski

zad 1

$$A = \begin{pmatrix} -1 & 1 & -4 \\ 2 & 2 & 0 \\ 3 & 3 & 2 \end{pmatrix} \qquad b = \begin{pmatrix} 0 \\ 1 \\ 0{,}5 \end{pmatrix}$$

$$\begin{aligned} -x + y - 4z &= 0 \\ 2x + 2y &= 1 \\ 3x + 3y + 2z &= 0{,}5 \end{aligned}$$

$$\left(\begin{array}{ccc|c} -1 & 1 & -4 & 0 \\ 2 & 2 & 0 & 1 \\ 3 & 3 & 2 & \frac{1}{2} \end{array}\right) \xrightarrow{W_2 - 2\cdot(-W_1)} \left(\begin{array}{ccc|c} -1 & 1 & -4 & 0 \\ 0 & 4 & -8 & 1 \\ 3 & 3 & 2 & \frac{1}{2} \end{array}\right) \xrightarrow{W_3 - 3\cdot(-W_1)}$$

$$\left(\begin{array}{ccc|c} -1 & 1 & -4 & 0 \\ 0 & 4 & -8 & 1 \\ 0 & 6 & -10 & \frac{1}{2} \end{array}\right) \xrightarrow{W_3 - \frac{3}{2}W_2} \left(\begin{array}{ccc|c} -1 & 1 & -4 & 0 \\ 0 & 4 & -8 & 1 \\ 0 & 0 & 2 & -1 \end{array}\right)$$

$$2z = -1 \Rightarrow z = -\frac{1}{2}$$

$$4y - 8z = 1$$

$$4y = 1 + 8z$$

$$4y = -3$$

$$y = -\frac{3}{4}$$

$$-x + y - 4z = 0$$

$$-x = 4z - y$$

$$x = -(-2) + \left(-\frac{3}{4}\right)$$

$$x = \frac{5}{4}$$

$$\begin{cases} x = \frac{5}{4} \\ y = -\frac{3}{4} \\ z = -\frac{1}{2} \end{cases}$$