

$$b) \begin{cases} 2x + y - z = 5 \\ x - 5y + 7z = -14 \end{cases}$$

Utvider matrise:

$$\begin{bmatrix} \textcircled{2} & 1 & -1 & 5 \\ 1 & -5 & 7 & -14 \end{bmatrix} \sim R_1 - 2R_2 \begin{bmatrix} 0 & 11 & -15 & 33 \\ 1 & -5 & 7 & -14 \end{bmatrix}$$

$$\begin{array}{r} R_1 \quad 2 \quad 1 \quad -1 \quad 5 \\ -2R_2 \quad -2 \quad 10 \quad -14 \quad 28 \\ \hline = \quad 0 \quad 11 \quad -15 \quad 33 \end{array}$$

$$\sim \begin{bmatrix} 1 & -5 & 7 & -14 \\ 0 & \textcircled{11} & -15 & 33 \end{bmatrix} \sim \frac{1}{11} \begin{bmatrix} 1 & -5 & 7 & -14 \\ 0 & 1 & -\frac{15}{11} & 3 \end{bmatrix} \sim R_1 + 5R_2 \begin{bmatrix} 1 & 0 & \frac{2}{11} & 1 \\ 0 & 1 & -\frac{15}{11} & 3 \end{bmatrix}$$

trappeform. redusert  $\rightarrow$

Kolonne 3 har ingen ledende 1'ere. z fri variabel.  
Innfører  $t = z$ .

$$\begin{array}{r} R_1 \quad 1 \quad -5 \quad 7 \quad -14 \\ 5R_2 \quad 0 \quad 5 \quad -\frac{25}{11} \quad 15 \\ \hline = \quad 1 \quad 0 \quad \frac{2}{11} \quad 1 \end{array}$$

$$\begin{array}{l} y - \frac{15}{11}t = 3 \Rightarrow y = 3 + \frac{15}{11}t \\ x + \frac{2}{11}t = 1 \Rightarrow x = 1 - \frac{2}{11}t \\ z = t \end{array}$$

Løsningsmengden:

$$(x, y, z) \in \left\{ \left( 1 - \frac{2}{11}t, 3 + \frac{15}{11}t, t \right) : t \in \mathbb{R} \right\}$$

$$\begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1 - \frac{2}{11}t \\ 3 + \frac{15}{11}t \\ t \end{pmatrix} = \begin{pmatrix} 1 \\ 3 \\ 0 \end{pmatrix} + t \begin{pmatrix} -\frac{2}{11} \\ \frac{15}{11} \\ 1 \end{pmatrix}$$

$$\left\{ \begin{pmatrix} 1 \\ 3 \\ 0 \end{pmatrix} + t \begin{pmatrix} -\frac{2}{11} \\ \frac{15}{11} \\ 1 \end{pmatrix} : t \in \mathbb{R} \right\}$$