b/ $\begin{cases} 2x + 3y + z = 10 \\ 2x - 3y - 3z = 22 \\ 4x - 2y + 3z = -2 \end{cases}$

$$\overline{A} = \begin{pmatrix} 2 & 3 & 1 & 10 \\ 2 & -3 & -3 & 22 \\ 4 & -2 & 3 & -2 \end{pmatrix}$$

$$= \begin{pmatrix} 1 & 1{,}5 & 0{,}5 & 5 \\ 0 & -6 & -4 & 12 \\ 0 & -8 & 1 & -22 \end{pmatrix}$$

$$= \begin{pmatrix} 1 & 1{,}5 & 0{,}5 & 5 \\ 0 & 1 & 2/3 & -2 \\ 0 & 0 & 19/3 & -38 \end{pmatrix}$$

$$\Leftrightarrow \begin{cases} x + 1{,}5y + 0{,}5z = 5 \\ y + \frac{2}{3}z = -2 \\ \frac{19}{3}z = -38 \end{cases}$$

$$\Leftrightarrow \begin{cases} x = 5 \\ y = 2 \\ z = -6 \end{cases}$$

c/ $\begin{cases} x + y = a \\ 2x + 3y = 1 - 2a \end{cases} \quad (a \in \mathbb{R})$

$$\overline{A} = \begin{pmatrix} 1 & 1 & a \\ 2 & 3 & 1-2a \end{pmatrix} \rightarrow \begin{pmatrix} 1 & 1 & a \\ 0 & 1 & 1-4a \end{pmatrix}$$

$$\Rightarrow \begin{cases} x = a - (1-4a) = 5a - 1 \\ y = 1 - 4a \end{cases}$$