

$$\boxed{3} \quad \left\{ \begin{array}{l} x + 2y + z = 2 \\ x - y - 2z = -1 \\ 2x + y - z = 1 \end{array} \right. \Leftrightarrow \begin{array}{l} L_1 - L_2 \\ 2L_1 - L_3 \end{array} \quad \left\{ \begin{array}{l} x + 2y + z = 2 \\ 3y + 3z = 3 \\ 3y + 3z = 3 \end{array} \right.$$

$$\Leftrightarrow \left\{ \begin{array}{l} x + 2y + z = 2 \\ y + z = 1 \end{array} \right. \quad \begin{array}{l} 2 \text{ équations et 3 inconnues, donc dimension } 1. \\ \text{C'est une droite. On exprime } y \text{ et } z \text{ à l'aide} \\ \downarrow 1 \text{ paramètre.} \end{array}$$

On pose $y = t \Rightarrow z = -t + 1$

$$\Rightarrow \text{c. } x = -2y - z + 2 = -2t + t - 1 + 2 = -t + 1$$

$$\boxed{\mathcal{P} = \{(-t+1, t, -t+1) \text{ où } t \in \mathbb{R}\}}$$

$$\boxed{4} \quad \left\{ \begin{array}{l} x + 2y + 2z = 4 \\ 2x - y - z = 0 \\ x + 2y - 2z = 1 \\ x + y + z = 1 \end{array} \right. \Leftrightarrow \begin{array}{l} 2L_1 - L_2 \\ L_1 - L_3 \\ L_1 - L_4 \end{array} \quad \left\{ \begin{array}{l} x + 2y + 2z = 4 \\ 5y + 5z = 8 \\ 4z = 3 \\ y + z = 3 \end{array} \right. \Leftrightarrow \begin{array}{l} \left\{ \begin{array}{l} x + 2y + 2z = 4 \\ 5y + 5z = 8 \\ 4z = 3 \end{array} \right. \\ L_2 - 5L_4 \quad \left\{ \begin{array}{l} 5y + 5z = 8 \\ 4z = 3 \\ 0 = -7 \end{array} \right. \end{array}$$

impossible

$$\boxed{\mathcal{P} = \emptyset}$$