Solutions

1

$\emptyset$

∞

7f ∞

$x + 4y = 8$

$y = -\frac{1}{4}x + 2$

$\frac{1}{4}x + y = 2$

$\begin{pmatrix} 1 & 4 & 8 \\ \frac{1}{4} & 1 & 2 \end{pmatrix}$ $+ \cdot (-4)$

$\sim \begin{pmatrix} 1 & 4 & 8 \\ 0 & 0 & 0 \end{pmatrix}$ → $x + 4y = 8$

∞ sol.

1 0

$1 + 4 \cdot 0 = 8$

$y = t \quad t \in \mathbb{R}$

$x = 8 - 4y = 8 - 4t$

Sol. $(8 - 4t, t), \quad t \in \mathbb{R}$

$(8 - 4y, y) \quad y \in \mathbb{R}$

(7e) $\emptyset$:

$2(y - x) = 0$

$-x + y = -3$

$\begin{pmatrix} -2 & 2 & 0 \\ -1 & 1 & -3 \end{pmatrix}$ $+ \cdot (-2)$

$\sim \begin{pmatrix} -2 & 2 & 0 \\ 0 & 0 & 6 \end{pmatrix}$

$-2x + 2y = 0$

$0x + 0y = 6$

not poss.

→ no sol.

$$x - y + 2z = 5$$
$$x + 2y - z = 1$$
$$2x + y + z = 4$$

$$\left(\begin{array}{ccc|c} 1 & -1 & 2 & 5 \\ 1 & 2 & -1 & 1 \\ 2 & 1 & 1 & 4 \end{array}\right) \sim \left(\begin{array}{ccc|c} 1 & -1 & 2 & 5 \\ 0 & 3 & -3 & -4 \\ 0 & -3 & 3 & 2 \end{array}\right)$$

$$\left(\begin{array}{ccc|c} 1 & -1 & 2 & 5 \\ 0 & 3 & -3 & -4 \\ 0 & 0 & 0 & -2 \end{array}\right) \therefore \rightarrow \boxed{\text{no sol.}}$$

$$x + 2y - 3z = -2$$
$$3x - y - 2z = 1$$
$$2x + 3y - 5z = -3$$

$$\left(\begin{array}{ccc|c} 1 & 2 & -3 & -2 \\ 3 & -1 & -2 & 1 \\ 2 & 3 & -5 & -3 \end{array}\right) \sim \left(\begin{array}{ccc|c} 1 & 2 & -3 & -2 \\ 0 & -7 & 7 & 7 \\ 0 & -1 & 1 & 1 \end{array}\right) \sim \left(\begin{array}{ccc|c} 1 & 2 & -3 & -2 \\ 0 & -7 & 7 & 7 \\ 0 & 0 & 0 & 0 \end{array}\right)$$

$$x + 2y - 3z = -2$$
$$-y + z = 1$$

$$\boxed{z = t}$$
$$y = z - 1 = \boxed{t - 1}$$
$$x = -2 - 2y + 3z$$
$$= -2 - 2(t-1) + 3t = \boxed{t}$$

$$(t, t-1, t)$$
$$t \in \mathbb{R}$$