1.

$$\begin{pmatrix} -7 & -1 & -2 & 5 \\ -6 & -1 & -2 & 5 \\ 4 & 1 & 3 & -7 \end{pmatrix}$$

$$\xrightarrow{\text{line2 } -= \text{ line1}} \begin{pmatrix} -7 & -1 & -2 & 5 \\ 1 & 0 & 0 & 0 \\ 4 & 1 & 3 & -7 \end{pmatrix} \xrightarrow{\text{line1} \leftrightarrow \text{line2}} \begin{pmatrix} 1 & 0 & 0 & 0 \\ -7 & -1 & -2 & 5 \\ 4 & 1 & 3 & -7 \end{pmatrix}$$

$$\xrightarrow{\text{line2 } += \text{ line1} \times (7)} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & -2 & 5 \\ 4 & 1 & 3 & -7 \end{pmatrix} \xrightarrow{\text{line3 } -= \text{ line1} \times (4)} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & -2 & 5 \\ 0 & 1 & 3 & -7 \end{pmatrix}$$

$$\xrightarrow{\text{line2} \leftrightarrow \text{line3}} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 3 & -7 \\ 0 & -1 & -2 & 5 \end{pmatrix} \xrightarrow{\text{line3 } += \text{ line2}} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 3 & -7 \\ 0 & 0 & 1 & -2 \end{pmatrix}$$

$$\xrightarrow{\text{line2 } -= \text{ line3} \times (3)} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & -2 \end{pmatrix}$$

したがって，$(x, y, z) = (0, -1, -2)$

2.

$$\begin{pmatrix} 1 & -1 & 2 & -6 \\ -1 & 3 & -5 & 9 \\ 2 & 1 & -1 & -7 \end{pmatrix}$$

$$\xrightarrow{\text{line2 } += \text{ line1}} \begin{pmatrix} 1 & -1 & 2 & -6 \\ 0 & 2 & -3 & 3 \\ 2 & 1 & -1 & -7 \end{pmatrix} \xrightarrow{\text{line3 } -= \text{ line1} \times (2)} \begin{pmatrix} 1 & -1 & 2 & -6 \\ 0 & 2 & -3 & 3 \\ 0 & 3 & -5 & 5 \end{pmatrix}$$

$$\xrightarrow{\text{line3 } -= \text{ line2}} \begin{pmatrix} 1 & -1 & 2 & -6 \\ 0 & 2 & -3 & 3 \\ 0 & 1 & -2 & 2 \end{pmatrix} \xrightarrow{\text{line2} \leftrightarrow \text{line3}} \begin{pmatrix} 1 & -1 & 2 & -6 \\ 0 & 1 & -2 & 2 \\ 0 & 2 & -3 & 3 \end{pmatrix}$$

$$\xrightarrow{\text{line1 } += \text{ line2}} \begin{pmatrix} 1 & 0 & 0 & -4 \\ 0 & 1 & -2 & 2 \\ 0 & 2 & -3 & 3 \end{pmatrix} \xrightarrow{\text{line3 } -= \text{ line2} \times (2)} \begin{pmatrix} 1 & 0 & 0 & -4 \\ 0 & 1 & -2 & 2 \\ 0 & 0 & 1 & -1 \end{pmatrix}$$

$$\xrightarrow{\text{line2 } += \text{ line3} \times (2)} \begin{pmatrix} 1 & 0 & 0 & -4 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & -1 \end{pmatrix}$$

したがって，$(x, y, z) = (-4, 0, -1)$

3.

$$\begin{pmatrix} -1 & 1 & -1 & 1 \\ 8 & -7 & 6 & -3 \\ -5 & 5 & -6 & 7 \end{pmatrix}$$

$$\xrightarrow{\text{line1 } \times = (-1)} \begin{pmatrix} 1 & -1 & 1 & -1 \\ 8 & -7 & 6 & -3 \\ -5 & 5 & -6 & 7 \end{pmatrix} \xrightarrow{\text{line2 } -= \text{ line1} \times (8)} \begin{pmatrix} 1 & -1 & 1 & -1 \\ 0 & 1 & -2 & 5 \\ -5 & 5 & -6 & 7 \end{pmatrix}$$

$$\xrightarrow{\text{line3 } += \text{ line1} \times (5)} \begin{pmatrix} 1 & -1 & 1 & -1 \\ 0 & 1 & -2 & 5 \\ 0 & 0 & -1 & 2 \end{pmatrix} \xrightarrow{\text{line1 } += \text{ line2}} \begin{pmatrix} 1 & 0 & -1 & 4 \\ 0 & 1 & -2 & 5 \\ 0 & 0 & -1 & 2 \end{pmatrix}$$

$$\xrightarrow{\text{line3 } \times= (-1)} \begin{pmatrix} 1 & 0 & -1 & 4 \\ 0 & 1 & -2 & 5 \\ 0 & 0 & 1 & -2 \end{pmatrix} \xrightarrow{\text{line1 } += \text{ line3}} \begin{pmatrix} 1 & 0 & 0 & 2 \\ 0 & 1 & -2 & 5 \\ 0 & 0 & 1 & -2 \end{pmatrix}$$
$$\xrightarrow{\text{line2 } += \text{ line3}\times(2)} \begin{pmatrix} 1 & 0 & 0 & 2 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & -2 \end{pmatrix}$$

したがって，$(x, y, z) = (2, 1, -2)$

4.

$$\begin{pmatrix} 1 & 1 & -1 & 3 \\ -3 & -2 & 3 & -9 \\ -3 & -1 & 2 & -8 \end{pmatrix}$$
$$\xrightarrow{\text{line2 } += \text{ line1}\times(3)} \begin{pmatrix} 1 & 1 & -1 & 3 \\ 0 & 1 & 0 & 0 \\ -3 & -1 & 2 & -8 \end{pmatrix} \xrightarrow{\text{line3 } += \text{ line1}\times(3)} \begin{pmatrix} 1 & 1 & -1 & 3 \\ 0 & 1 & 0 & 0 \\ 0 & 2 & -1 & 1 \end{pmatrix}$$
$$\xrightarrow{\text{line1 } -= \text{ line2}} \begin{pmatrix} 1 & 0 & -1 & 3 \\ 0 & 1 & 0 & 0 \\ 0 & 2 & -1 & 1 \end{pmatrix} \xrightarrow{\text{line3 } -= \text{ line2}\times(2)} \begin{pmatrix} 1 & 0 & -1 & 3 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 1 \end{pmatrix}$$
$$\xrightarrow{\text{line3 } \times= (-1)} \begin{pmatrix} 1 & 0 & -1 & 3 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & -1 \end{pmatrix} \xrightarrow{\text{line1 } += \text{ line3}} \begin{pmatrix} 1 & 0 & 0 & 2 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & -1 \end{pmatrix}$$

したがって，$(x, y, z) = (2, 0, -1)$

6.

$$\begin{pmatrix} 1 & -2 & -1 & -2 \\ -2 & 4 & 1 & 2 \\ -3 & 5 & 3 & 7 \end{pmatrix}$$
$$\xrightarrow{\text{line2 } += \text{ line1}\times(2)} \begin{pmatrix} 1 & -2 & -1 & -2 \\ 0 & 0 & -1 & -2 \\ -3 & 5 & 3 & 7 \end{pmatrix} \xrightarrow{\text{line3 } += \text{ line1}\times(3)} \begin{pmatrix} 1 & -2 & -1 & -2 \\ 0 & 0 & -1 & -2 \\ 0 & -1 & 0 & 1 \end{pmatrix}$$
$$\xrightarrow{\text{line2 } \leftrightarrow \text{ line3}} \begin{pmatrix} 1 & -2 & -1 & -2 \\ 0 & -1 & 0 & 1 \\ 0 & 0 & -1 & -2 \end{pmatrix} \xrightarrow{\text{line2 } \times= (-1)} \begin{pmatrix} 1 & -2 & -1 & -2 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & -1 & -2 \end{pmatrix}$$
$$\xrightarrow{\text{line1 } += \text{ line2}\times(2)} \begin{pmatrix} 1 & 0 & -1 & -4 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & -1 & -2 \end{pmatrix} \xrightarrow{\text{line3 } \times= (-1)} \begin{pmatrix} 1 & 0 & -1 & -4 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & 2 \end{pmatrix}$$
$$\xrightarrow{\text{line1 } += \text{ line3}} \begin{pmatrix} 1 & 0 & 0 & -2 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & 2 \end{pmatrix}$$

したがって，$(x, y, z) = (-2, -1, 2)$