1) $\begin{cases} x + ky + z = 2 \\ -x - 2y + 3z = -1 \\ 3x + kz = 5 \end{cases}$

$$\left[\begin{array}{ccc|c} 1 & k & 1 & 2 \\ -1 & -2 & 3 & -1 \\ 3 & 0 & k & 5 \end{array}\right]$$

$L_1 \leftrightarrow L_2$

$$\left[\begin{array}{ccc|c} 1 & 2 & -3 & 1 \\ 1 & k & 1 & 2 \\ 3 & 0 & k & 5 \end{array}\right]$$

$L_2 \to L_2 - L_1$

$L_3 \to L_3 - 3L_1$

$$\left[\begin{array}{ccc|c} 1 & 2 & -3 & 1 \\ 0 & k-2 & -2 & 1 \\ 0 & -6 & k+9 & 2 \end{array}\right]$$