

$$\left[\begin{array}{ccc|c} 1 & -2 & 1 & 2 \\ 2 & -6 & 11 & 35 \\ -3 & 5 & 1 & 8 \end{array} \right] \xrightarrow{-2} \left[\begin{array}{ccc|c} 1 & -2 & 1 & 2 \\ 0 & -4 & 9 & 27 \\ -3 & 5 & 1 & 8 \end{array} \right]$$

$$\left[\begin{array}{ccc|c} 1 & -2 & 1 & 2 \\ 0 & -2 & 9 & 31 \\ 0 & -1 & 4 & 14 \end{array} \right] \xrightarrow{\text{Row operations}}$$

$$\left[\begin{array}{ccc|c} 1 & -2 & 1 & 2 \\ 0 & -1 & 4 & 14 \\ 0 & -2 & 9 & 31 \end{array} \right] \xrightarrow[-2]{} \left[\begin{array}{ccc|c} 1 & -2 & 1 & 2 \\ 0 & -1 & 4 & 14 \\ 0 & 0 & 1 & 11 \end{array} \right]$$

$$\left[\begin{array}{ccc|c} 1 & -2 & 1 & 2 \\ 0 & 1 & -4 & -14 \\ 0 & 0 & 1 & 3 \end{array} \right] \xrightarrow{\text{Step 1}} \left[\begin{array}{ccc|c} 1 & -2 & 1 & 2 \\ 0 & 1 & -4 & -14 \\ 0 & 0 & 1 & 3 \end{array} \right] \xrightarrow{\text{Step 2}} \left[\begin{array}{ccc|c} 1 & -2 & 1 & 2 \\ 0 & 1 & -4 & -14 \\ 0 & 0 & 1 & 3 \end{array} \right]$$

$$\Rightarrow \left\{ \begin{array}{l} x = -5 \\ y = -2 \\ z = 3 \end{array} \right.$$

$$\left[\begin{array}{ccc|c} 1 & -2 & 0 & -1 \\ 0 & 1 & 0 & -2 \\ 0 & 0 & 1 & 3 \end{array} \right] \xrightarrow{R_2 \leftrightarrow R_2} \left[\begin{array}{ccc|c} 1 & -2 & 0 & -1 \\ 0 & 1 & 0 & -2 \\ 0 & 0 & 1 & 3 \end{array} \right]$$

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