23 The system can be written as follows.

$$\left[\begin{array}{ccc|c} 1 & 2 & 1 & 3 \\ 1 & 1 & -1 & 3 \\ -1 & -2 & 1 & -5 \end{array}\right] \begin{array}{c} \\ R_2 - R_1 \rightarrow \\ R_3 + R_1 \rightarrow \end{array} \left[\begin{array}{ccc|c} 1 & 2 & 1 & 3 \\ 0 & -1 & -2 & 0 \\ 0 & 0 & 2 & -2 \end{array}\right] \begin{array}{c} \\ -1R_2 \rightarrow \\ \frac{1}{2}R_2 \rightarrow \end{array} \left[\begin{array}{ccc|c} 1 & 2 & 1 & 3 \\ 0 & 1 & 2 & 0 \\ 0 & 0 & 1 & -1 \end{array}\right]$$

Back substitution produces $z = -1$; $y + 2z = 0 \Rightarrow y = 2$; $x + 2y + z = 3 \Rightarrow x = 0$.

The solution is $(0, 2, -1)$.