

SECTION 2.4 SOLUTIONS

4.1 (a)

$$\begin{aligned} & \left[\begin{array}{ccc|ccc} 1 & 2 & 1 & 1 & 0 & 0 \\ 3 & 7 & 3 & 0 & 1 & 0 \\ 2 & 3 & 4 & 0 & 0 & 1 \end{array} \right] \rightarrow \left[\begin{array}{ccc|ccc} 1 & 2 & 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & -3 & 1 & 0 \\ 0 & -1 & 2 & -2 & 0 & 1 \end{array} \right] \rightarrow \left[\begin{array}{ccc|ccc} 1 & 2 & 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & -3 & 1 & 0 \\ 0 & 0 & 2 & -5 & 1 & 1 \end{array} \right] \\ & \rightarrow \left[\begin{array}{ccc|ccc} 1 & 0 & 1 & 7 & -2 & 0 \\ 0 & 1 & 0 & -3 & 1 & 0 \\ 0 & 0 & 2 & -5 & 1 & 1 \end{array} \right] \rightarrow \left[\begin{array}{ccc|ccc} 1 & 0 & 1 & 7 & -2 & 0 \\ 0 & 1 & 0 & -3 & 1 & 0 \\ 0 & 0 & 1 & \frac{-5}{2} & \frac{1}{2} & \frac{1}{2} \end{array} \right] \rightarrow \left[\begin{array}{ccc|ccc} 1 & 0 & 0 & \frac{19}{2} & \frac{-5}{2} & \frac{-1}{2} \\ 0 & 1 & 0 & -3 & 1 & 0 \\ 0 & 0 & 1 & \frac{-5}{2} & \frac{1}{2} & \frac{1}{2} \end{array} \right] \end{aligned}$$

(b)

$$\begin{aligned} & \left[\begin{array}{ccc|ccc} 1 & -1 & 2 & 1 & 0 & 0 \\ 1 & 1 & -2 & 0 & 1 & 0 \\ 1 & 1 & 4 & 0 & 0 & 1 \end{array} \right] \rightarrow \left[\begin{array}{ccc|ccc} 1 & -1 & 2 & 1 & 0 & 0 \\ 0 & 2 & -4 & -1 & 1 & 0 \\ 0 & 2 & 2 & -1 & 0 & 1 \end{array} \right] \rightarrow \left[\begin{array}{ccc|ccc} 1 & -1 & 2 & 1 & 0 & 0 \\ 0 & 1 & -2 & \frac{-1}{2} & \frac{1}{2} & 0 \\ 0 & 1 & 1 & \frac{-1}{2} & 0 & \frac{1}{2} \end{array} \right] \\ & \rightarrow \left[\begin{array}{ccc|ccc} 1 & -1 & 2 & 1 & 0 & 0 \\ 0 & 1 & -2 & \frac{-1}{2} & \frac{1}{2} & 0 \\ 0 & 0 & 3 & 0 & \frac{-1}{2} & \frac{1}{2} \end{array} \right] \rightarrow \left[\begin{array}{ccc|ccc} 1 & -1 & 2 & 1 & 0 & 0 \\ 0 & 1 & -2 & \frac{-1}{2} & \frac{1}{2} & 0 \\ 0 & 0 & 1 & 0 & \frac{-1}{6} & \frac{1}{6} \end{array} \right] \rightarrow \left[\begin{array}{ccc|ccc} 1 & 0 & 0 & \frac{1}{2} & \frac{1}{2} & 0 \\ 0 & 1 & -2 & \frac{-1}{2} & \frac{1}{2} & 0 \\ 0 & 0 & 1 & 0 & \frac{-1}{6} & \frac{1}{6} \end{array} \right] \\ & \rightarrow \left[\begin{array}{ccc|ccc} 1 & 0 & 0 & \frac{1}{2} & \frac{1}{2} & 0 \\ 0 & 1 & 0 & \frac{-1}{2} & \frac{1}{6} & \frac{1}{6} \\ 0 & 0 & 1 & 0 & \frac{-1}{6} & \frac{1}{6} \end{array} \right] \end{aligned}$$