

$$-21x - 2y + z = -60$$

$$12x + y = 35$$

$$-24x - 2y + z = -69$$

For our Purposes, may be the following is a superior method

$$\left[ \begin{array}{ccc|c} -21 & -2 & 1 & -60 \\ 12 & 1 & 0 & 35 \\ -24 & -2 & 1 & -69 \end{array} \right] \begin{array}{l} 12R1 \\ 21R2 \\ R3 \end{array} \left[ \begin{array}{ccc|c} -252 & -24 & 12 & -720 \\ 252 & 21 & 0 & 735 \\ -24 & -2 & 1 & -69 \end{array} \right]$$

$$\begin{array}{l} R1 \div 12 \\ R1 + R2 \\ R3 \end{array} \left[ \begin{array}{ccc|c} -21 & -2 & 1 & -60 \\ 0 & -3 & 12 & 15 \\ -24 & -2 & 1 & -69 \end{array} \right] \begin{array}{l} -24R1 \\ -\frac{1}{3}R2 \\ 21R3 \end{array} \left[ \begin{array}{ccc|c} 504 & 48 & -24 & 1440 \\ 0 & 1 & -4 & -5 \\ -504 & -42 & 21 & -1449 \end{array} \right]$$

$$\begin{array}{l} R1 \div (-24) \\ R2 \\ R1 + R3 \end{array} \left[ \begin{array}{ccc|c} -21 & -2 & 1 & -60 \\ 0 & 1 & -4 & -5 \\ 0 & 6 & -3 & -9 \end{array} \right] \begin{array}{l} R1 \\ -6R2 \\ R3 \end{array} \left[ \begin{array}{ccc|c} -21 & -2 & 1 & -60 \\ 0 & -6 & 24 & 30 \\ 0 & 6 & -3 & -9 \end{array} \right]$$

$$\begin{array}{l} R1 \\ R2 \div (-6) \\ R2 + R3 \end{array} \left[ \begin{array}{ccc|c} -21 & -2 & 1 & -60 \\ 0 & 1 & -4 & -5 \\ 0 & 0 & 21 & 21 \end{array} \right] \begin{array}{l} R3 \div 21 \end{array} \left[ \begin{array}{ccc|c} -21 & -2 & 1 & -60 \\ 0 & 1 & -4 & -5 \\ 0 & 0 & 1 & 1 \end{array} \right]$$

$$-21x + 2y + z = -60$$

$$-21x - 2(-1) + 1 = -60$$

$$-21x + 3 = -60$$

$$-21x = -63$$

$$z = 1$$

$$y - 4z = -5$$

$$y - 4(1) = -5$$

$$y = -1$$

$$x = 3$$

$$\{ (3, -1, 1) \}$$