

$$\begin{cases} \#4 \\ 12x - 4y = 20 \\ 18x = 6y + 30 \end{cases}$$

$$\begin{aligned} 3x - y &= 5 & y &= 3x + 5 \\ -(3x - y &= 5) & \frac{3x}{3} &= \frac{5+y}{3} \\ 0 &= 0 & x &= \frac{5}{3} + \frac{1}{3}y \\ \text{Inf. many solutions} & & & \\ (a, 3a+5) & & & \\ (\frac{1}{3}a + \frac{5}{3}, a) & & & \end{aligned}$$

$$\begin{cases} \#5 \\ 2x + 3y + 5z = 14 \\ 3(3x - y + 4z = 79) \\ x + 3y + 2z = -19 \\ 9x - 3y + 12z = 237 \end{cases}$$

$$\begin{aligned} & \underline{z = 7} \\ & \underline{(12, -15, 7)} \end{aligned}$$

$$\begin{aligned} 5(11x + 17z &= 251) \\ -10(10x + 11z &= 218) \\ -11(5x + 7z &= 109) \\ \hline 55x + 85z &= 1255 \\ -55x - 77z &= 1199 \\ \hline 8z &= 56 \end{aligned}$$

$$\begin{aligned} 5x + 17(7) &= 109 \\ -49 & -49 \\ \hline 5x &= 60 \\ x &= 12 & y &= -15 \\ \hline 12 + 3y + 4 &= -19 \\ -26 & -26 \\ \hline 3y &= -45 \end{aligned}$$

#6

$$\begin{cases} x - 3y + 7z = 13 \\ 2x - y - z = 36 \\ 5x + 2y - 16z = 99 \end{cases} \begin{array}{l} -2R_1 + R_2 \rightarrow (5y - 15z = 10) : 5 \\ -5R_1 + R_3 \rightarrow (17y - 51z = 34) : 17 \end{array}$$

$$\begin{array}{l} x - 3(3a + 2) + 7a = 13 \\ x - 9a + 6 + 7a = 13 \\ x - 2a + 6 = 13 \\ x = 19 + 2a \end{array} \quad \begin{array}{l} y - 3z = 2 \\ y = 3z + 2 \\ (2a + 19, 3a + 2, a) \end{array}$$

$(2a + 19, 3a + 2, a)$ $(b, \frac{2}{3}b - \frac{5}{2}, \frac{1}{2} - \frac{19}{2})$

Let $x = b$

$$b = 2a + 19$$

$$\begin{array}{r} -19 \\ -19 \end{array}$$

$$\frac{b - 19}{2} = \frac{2a}{2}$$

$$a = \frac{b}{2} - \frac{19}{2}$$

$$3\left(\frac{b}{2} - \frac{19}{2}\right) + 2$$

$$\frac{3b}{2} - \frac{57}{2} + \frac{4}{2}$$

Let $y = c$ $\left(\frac{2c}{3} + \frac{5}{3}, \frac{c}{3} - \frac{2}{3}\right)$

$$c = 3a + 2$$

$$\begin{array}{r} -2 \\ -2 \end{array}$$

$$\frac{c - 2}{3} = \frac{3a}{3}$$

$$a = \frac{c}{3} - \frac{2}{3}$$

$$2\left(\frac{c}{3} - \frac{2}{3}\right) + 19$$

$$\frac{2c}{3} - \frac{4}{3} + \frac{57}{3}$$

$$\frac{2c}{3} + \frac{53}{3}$$

$$\begin{aligned}
& \frac{\#2}{-3(x+4y-16z=15)} \quad (4f-17, 3f+8, f) \\
& \left\{ \begin{array}{l} 3x+7y-33z=5 \\ -3x-12y+48z=-45 \end{array} \right. \\
& (-5) \rightarrow -5y+15z=-40 \\
& \quad y-3z=8 \\
& \quad y=3z+8 \\
& \text{Let } z=f \\
& \quad x+4(3f+8)-16f=15 \\
& \quad x+12f+32-16f=15 \\
& \quad \quad -32+4f-32f \\
& \quad x=4f-17
\end{aligned}$$