

13)	$\{(1, 3, 2)\}$	18)	$\{(-1, 3, -2)\}$
14)	$\{(5, -5, 3)\}$	19)	infinite solutions
15)	$\{(-1, 2, 3)\}$	20)	infinite solutions
16)	$\{(4, -2, 2)\}$	21)	\emptyset
17)	$\{(1, -1, -\frac{1}{2})\}$	22)	\emptyset

13) $3a - 2b + 2c = 1$
 $2a + 5b - 5c = 7$
 $4a - 3b + c = -3$

$(-2) \rightarrow$

$$\begin{array}{r} 3a - 2b + 2c = 1 \\ -8a + 6b - 2c = 6 \\ \hline -5a + 4b = 7 \\ -5 + 4b = 7 \\ 4b = 12 \quad b = 3 \end{array}$$

$(5) \rightarrow$

$$\begin{array}{r} 2a + 5b - 5c = 7 \\ 20a - 15b + 5c = -15 \\ \hline 22a - 10b = -8 \end{array}$$

$(2) \rightarrow$

$$\begin{array}{r} -5a + 4b = 7 \\ -25a + 20b = 35 \\ 44a - 20b = -16 \\ \hline 19a = 19 \\ a = 1 \end{array}$$

$4(1) - 3(3) + c = -3$
 $-5 + c = -3$
 $c = 2$

$\{(1, 3, 2)\}$

15) $3u + 2v + w = 4$
 $5u + 3v - w = 2$
 $2u + w = 1$

$(2) \rightarrow$

$$\begin{array}{r} 8u + 5v = 2 \\ 24u + 15v = 6 \\ \hline -36u - 15v = 6 \\ \hline -11u = 11 \\ u = -1 \end{array}$$

$(5) \rightarrow$

$$\begin{array}{r} 7u + 3v = -1 \\ 7(-1) + 3v = -1 \\ -7 + 3v = -1 \\ 3v = 6 \\ v = 2 \end{array}$$

$\{(-1, 2, 3)\}$

$2(-1) + w = 1$
 $w = 3$

17) $\frac{1}{x} - \frac{2}{y} + \frac{3}{z} = -3$
 $\frac{2}{x} - \frac{3}{y} - \frac{1}{z} = 7$
 $\frac{3}{x} + \frac{1}{y} - \frac{2}{z} = 6$

$(-2) \rightarrow$

$$\begin{array}{r} \frac{1}{x} - \frac{2}{y} + \frac{3}{z} = -3 \\ \frac{2}{x} - \frac{3}{y} - \frac{1}{z} = 7 \\ \hline -\frac{1}{x} + \frac{7}{y} - \frac{2}{z} = 6 \end{array}$$

$(3) \rightarrow$

$$\begin{array}{r} \frac{1}{x} - \frac{2}{y} + \frac{3}{z} = -3 \\ \frac{6}{x} - \frac{9}{y} - \frac{3}{z} = 21 \\ \hline \frac{7}{x} - \frac{11}{y} = 18 \\ -\frac{7}{x} + \frac{49}{y} = -56 \\ \hline \frac{38}{y} = -38 \\ y = -1 \end{array}$$

$(7) \rightarrow$

$$\begin{array}{r} -\frac{1}{x} + \frac{7}{y} - \frac{2}{z} = 6 \\ -\frac{1}{x} + \frac{7}{-1} - \frac{2}{z} = 6 \\ -\frac{1}{x} - 7 - \frac{2}{z} = 6 \\ -\frac{1}{x} - \frac{2}{z} = 13 \end{array}$$

$\frac{2}{1} - \frac{3}{-1} - \frac{1}{z} = 7$
 $2 + 3 - \frac{1}{z} = 7$
 $5 - \frac{1}{z} = 7$
 $-\frac{1}{z} = 2$
 $\frac{1}{z} = -2$
 $z = -\frac{1}{2}$

$-\frac{1}{x} - 7 = 13$
 $-\frac{1}{x} = 20$
 $x = -\frac{1}{20}$

$\{(1, -\frac{1}{2}, -1)\}$