1-a) $\begin{cases} x+2y+4z=1 \\ 3x-y+2z=-2 \\ -x+3y-2z=0 \end{cases}$ $\begin{cases} x+2y+4z=1 \\ -7y-10z=-5 \\ -36z=-18 \end{cases}$

$l_2 = l_2 + (-3)x - 6y - 12z = -3$

$3x - y + 2z = -2$

$-7y - 10z = -5$

$l_3 = l_3 + (-1)x + 2y + 4z = 1$

$-x + 3y - 2z = 0$

$5y + 2z = 1$

$l_3 = l_3 + (-35)y - 50z = -25$

$35y + 14z = 7$

$-36z = -18$

$z = \frac{-18}{-36} = \frac{1}{2}$

$-7y - 10 \cdot \frac{1}{2} = -5$

-5

$7y = 0$

$y = 0$

$x + 2 \cdot 0 + 4 \cdot \frac{1}{2} = 1$

$x + 2 = 1$

$x = -1$

$S = \{(-1, 0, 1/2)\}$

b) $\begin{cases} x+y=-1 \\ 2x-y-3z=-2 \\ 5x+2y-z=-5 \end{cases}$ $\begin{cases} x+y=-1 \\ -3y-3z=0 \\ 2z=0 \end{cases}$

$l_2 = x+y=-1 \quad (-2)$

$+ \quad -2x-2y+0z=2$

$2x-y-3z=-2$

$-3y-3z=0$

$l_3 = -5x-5y=5$

$5x+2y-z=-5$

$-3y-z=0$

$l_3 = 3y+3z=0$

$-3y-z=0$

$2z=0$

$z=0$

$y=0 \quad z=0$

$x=-1$

$S=\{(-1,0,0)\}$

C) $\begin{cases} 3x+y+2z=-3 \\ 2x+2y-z=1 \\ 4x+3y+3z=3 \end{cases} = \begin{cases} 3x+y+2z=-3 \\ -4y+7z=9 \end{cases}$

$l_2 = 6x+2y+4z=-6$
$-6x-6y+3z=3$
$-4y+7z=9$

$l_3 = 12x+4y+8z=12$
$-12x+(-9y)+(-9z)=-9$
$-5y-z=21$

$l_3 = -20y+35z=-45$
$+20y+4z=+84$
$+39z=39$

$z=1$
$y=-9-7=4$
$x=-(4+2)-3/3=-3$

$S=\{(-3,4,1)\}$

D) $\begin{cases} x+2y+z+t=0 \\ x+3y-z+2t=0 \end{cases}$

$l_2 = x-2y-z-t=0$
$x+3y-z+2t=0$
$y-2z+t=0$
$K \quad K_2$

$x+2y+K+K_2=0$
$y-2K+K_2=0$

$y=+2K-K_2$

$x+2(+2K-K_2)+K+K_2=0$
$x+4K-2K_2+K+K_2=0 = x+5K-K_2=0$

$x = -5K + K_2$

$S = \{(-5K+K_2, 2K-K_2, K, K_2)\}$

e) $\begin{cases} -x+2y-z=3 \\ 2x+y+3z=5 \\ 3x+4y+5z=13 \end{cases} = \begin{cases} -x+2y-z=3 \\ 5y+z=11 \\ 0+0=0 \end{cases}$

$l_2 = -2x+4y-2z=6$

$2x+y+3z=5$

$+5y+z=11$

$l_3 = -3x+6y-3z=9$

$3x+4y+5z=13$

$\frac{10y+2z=22}{2}$

$5y+z=11$

$z = K \qquad 5y+K=11$

$y = \frac{11-K}{5}$

$-x+2\left(\frac{11-K}{5}\right)-K=3 = -x+22-2K-5K=3$

$-x+\frac{22-2K-5K}{5}=3 \rightarrow -x+22-7K=3$

$$-x = \frac{3}{1} - \frac{22 - 7k}{5}$$

$$-x = \frac{15 + 22 + 7k}{5} \Rightarrow -x = -7 + 7k/5 \quad (-1)$$

$$x = \frac{7 - 7k}{5}$$

$$S = \left\{\left(\frac{7 - 7k}{5}, \frac{11 - k}{5}, k\right)\right\}$$