1. Describe of the solution set of each using vector notation.

a)

$$\begin{aligned} x+\ \ y-\ \ z&=5\\ 2y+3z&=9\\ 0&=0 \end{aligned}$$

b)

$$\begin{aligned} 2x-\ \ y+z+\ \ w&=\ \ 1\\ -y\qquad +2w&=-1\\ 0&=\ \ 0 \end{aligned}$$

2. Use Gauss's method to solve each system using matrix notation. Give the solution set description in vector notation.

a)

$$\begin{aligned} x-2y\qquad &=\ \ 3\\ 2y-3z&=\ \ 4\\ 2x-2y-3z&=10 \end{aligned}$$

b)

$$\begin{aligned} a-\ \ b-c\qquad &=\ \ 3\\ -a+\ \ b+c-\ \ d&=\ \ 0\\ 2a-2b+c-2d&=-1 \end{aligned}$$

3. The prior question shows that the solution set of

$$\begin{aligned} x-2y\qquad &=\ \ 3\\ 2y-3z&=\ \ 4\\ 2x-2y-3z&=10 \end{aligned}$$

is this.

$$\{\begin{pmatrix} x\\ y\\ z \end{pmatrix}=\begin{pmatrix} 7\\ 2\\ 0 \end{pmatrix}+\begin{pmatrix} 3\\ 3/2\\ 1 \end{pmatrix}\cdot z \mid z\in\mathbb{R}\}.$$

a) Give the associated homogenous system.

b) Describe its solution set using vector notation.

c) Find the solution of the original system when $z=1$.

d) Use it to give a different description of the solution set.