

$$x + 3y + 5z + 2t = 2$$

$$-y + 3z + 4t = 0$$

$$2x + y + 9z + 6t = -3$$

$$3x + 2y + 4z + 8t = -1$$

Using Gaussian Elimination to find solution of the above system of equations.

Augmented Matrix;

$$\left[\begin{array}{cccc|c} 1 & 3 & 5 & 2 & 2 \\ 0 & -1 & 3 & 4 & 0 \\ 2 & 1 & 9 & 6 & -3 \\ 3 & 2 & 4 & 8 & -1 \end{array} \right]$$

Using Elementary Row operation.

$$\left[\begin{array}{cccc|c} 1 & 3 & 5 & 2 & 2 \\ 0 & -1 & 3 & 4 & 0 \\ 0 & -5 & -1 & 2 & -7 \\ 0 & -7 & -11 & 2 & -7 \end{array} \right]$$

$$\left[\begin{array}{cccc|c} 1 & 3 & 5 & 2 & 2 \\ 0 & -1 & 3 & 4 & 0 \\ 0 & 0 & -16 & -18 & -7 \\ 0 & 0 & -32 & -26 & -7 \end{array} \right]$$

$$\left[\begin{array}{cccc|c} 1 & 3 & 5 & 2 & 2 \\ 0 & -1 & 3 & 4 & 0 \\ 0 & 0 & -16 & -18 & -7 \\ 0 & 0 & -32 & -26 & -7 \end{array} \right]$$

$$\left[\begin{array}{cccc|c} 1 & 3 & 5 & 2 & 2 \\ 0 & -1 & 3 & 4 & 0 \\ 0 & 0 & -16 & -18 & -7 \\ 0 & 0 & 0 & 10 & 7 \end{array} \right]$$

$$\left[\begin{array}{cccc|c} -1 & 1 & 3 & 0 & 0 \\ 0 & 1 & -3 & -4 & 0 \\ 0 & 0 & 1 & 9/8 & 7/16 \\ 0 & 0 & 0 & 1 & 7/10 \end{array} \right]$$

have the equations;

$$+4 + 3z = 0 -$$

$$-3z - 4t = 0$$

$$z + 9/8 t = 7/16$$

$$\boxed{t = 7/10}$$

Now; eq "iii" \Rightarrow

$$z + \frac{9}{8} \left(\frac{7}{10} \right) = \frac{7}{16}$$

$$z + \frac{63}{80} = \frac{7}{16}$$

$$z = \frac{7}{16} - \frac{63}{80}$$

$$= \frac{35 - 63}{80}$$

$$= -\frac{28}{80}$$

$$\boxed{z = -\frac{7}{20}}$$

Now; eq "ii" \Rightarrow

$$y - 3 \left(-\frac{7}{20} \right) - 4 \left(\frac{7}{10} \right) = 0$$

$$y + \frac{21}{20} - \frac{14}{5} = 0$$

$$y = \frac{14}{5} - \frac{21}{20} = \frac{56 - 21}{20} = \frac{35}{20}$$

$$\boxed{y = \frac{7}{4}}$$

Now; eq "i" \Rightarrow

$$-x + \frac{7}{4} + 3 \left(-\frac{7}{20} \right) = 0$$

$$x = -\frac{21}{20} + \frac{7}{4} = \frac{-21 + 35}{20} = \frac{14}{20}$$

$$\boxed{x = \frac{7}{10}}$$