Step-1

Given system is $2u+3v=0$

$4u+5v+w=3$

$2u-v-3w=5$

We have to find the pivots and solve this system by applying elimination and back-substitution.

Step-2

Given system can be written as

$$\begin{pmatrix} 2 & 3 & 0 & 0 \\ 4 & 5 & 1 & 3 \\ 2 & -1 & -3 & 5 \end{pmatrix}$$

Subtract â€˜2â€™ times the row 1 from the row 2

Subtract â€˜1â€™ time the row 1 from the row 3

$$\begin{pmatrix} 2 & 3 & 0 & 0 \\ 0 & -1 & 1 & 3 \\ 0 & -4 & -3 & 5 \end{pmatrix}$$

Step-3

Subtract â€˜4â€™ times the row 2 from the row 3.

$$\begin{pmatrix} 2 & 3 & 0 & 0 \\ 0 & -1 & 1 & 3 \\ 0 & 0 & -7 & -7 \end{pmatrix}$$

which is upper triangular form.

The pivots are circled in $\begin{pmatrix} \boxed{2} & 3 & 0 & 0 \\ 0 & \boxed{-1} & 1 & 3 \\ 0 & 0 & \boxed{-7} & -7 \end{pmatrix}$

That is $\boxed{2,-1,-7}$

Step-4

Back ward substitution:-

From above upper triangular form, we have

$$2u+3v=0$$

$$-v+w=0$$
$$-7w=-7$$

And $-7w = -7 \Rightarrow \boxed{w=1}$

$$-v+w=3$$
$$\Rightarrow -v+1=3$$
$$\Rightarrow \boxed{v=-2}$$

$$2u+3v=0$$
$$\Rightarrow 2u+3(-2)=0$$
$$\Rightarrow \boxed{u=3}$$

Solutions are $\boxed{u=3, v=-2, w=1}$

Step-5

List of operations are :-

(i) Subtract â€˜2â€™ times the row 1 from the row 2

(ii) Subtract â€˜1â€™ time the row 1 from the row 3 and

(iii) Subtract â€˜4â€™ times the row 2 from the row 3.