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 '2' times the row 1 from the row 2

Subtract '1' 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 '4' 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.

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

The pivots are circled in

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 '2' times the row 1 from the row 2

(ii) Subtract '1' time the row 1 from the row 3 and

(iii) Subtract '4' times the row 2 from the row 3.