Answer on Question #59715 – Math – Linear Algebra

Question

Solve the set of linear equations by Gaussian elimination method : a+2b+3c=5, 3a-b+2c=8, 4a-6b-4c=-2. Find c

Solution

$$\begin{cases} a+2b+3c=5 \\ 3a-b+2c=8 \\ 4a-6b-4c=-2 \end{cases}$$ the second equation minus the first equation multiplied by 3→

$$\begin{cases} a+2b+3c=5 \\ -7b-7c=-7 \\ 4a-6b-4c=-2 \end{cases}$$ the third equation minus the first equation multiplied by 4→

$$\begin{cases} a+2b+3c=5 \\ -7b-7c=-7 \\ -14b-16c=-22 \end{cases}$$ the third equation minus the second equation multiplied by 2→

$$\begin{cases} a+2b+3c=5 \\ -7b-7c=-7 \\ -2c=-8 \end{cases}$$ divide the second equation by (-7) and the third one by (-2) →

$$\begin{cases} a+2b+3c=5 \\ b+c=1 \\ c=4 \end{cases}$$

So,

$c = 4,$

$b = 1 - c = 1 - 4 = -3,$

$a = 5 - 2b - 3c = 5 - 2 \cdot (-3) - 3 \cdot 4 = -1.$

Answer: $c = 4$.