Answer on Question # 40992 – Math – Linear Algebra

Question:

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

Solution:

Rewrite the system in matrix form and solve it by Gaussian Elimination

$$\begin{bmatrix} 1 & 2 & 3 & 5 \\ 3 & -1 & 2 & 8 \\ 4 & -6 & -4 & 2 \end{bmatrix}$$

from 2; 3 rows we subtract the 1-th row, multiplied respectively by 3; 4

$$\begin{bmatrix} 1 & 2 & 3 & 5 \\ 0 & -7 & -7 & -7 \\ 0 & -14 & -16 & -18 \end{bmatrix}$$

devide the 2-th row by -7

$$\begin{bmatrix} 1 & 2 & 3 & 5 \\ 0 & 1 & 1 & 1 \\ 0 & -14 & -16 & -18 \end{bmatrix}$$

from 1; 3 rows we subtract the 2-th row, multiplied respectively by 2; -14

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

devide the 3-th row by -2

$$\begin{bmatrix} 1 & 0 & 1 & 3 \\ 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 2 \end{bmatrix}$$

from 1; 2 rows we subtract the 3-th row, multiplied respectively by 1; 1

$$\begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & 2 \end{bmatrix}$$

Answer:

$$\begin{cases} a = 1 \\ b = -1 \\ c = 2 \end{cases}$$