

**Answer on Question #40997 – 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:**

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

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

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

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

divide the 2-th row by -7

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

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

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

divide the 3-th row by -2

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

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

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

**Answer:**

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

**Answer:  $c = 2$**