Answer on Question #41217 – Math – Linear Algebra

Question:

Find x by the use of determinant : 3x-4y+2z+8=0, x+5y-3z+2=0, 5x+3y-z+6=0

Solution:
Using the triangle rule we can find

$$\Delta = \begin{vmatrix} 3 & -4 & 2 \\ 1 & 5 & -3 \\ 5 & 3 & -1 \end{vmatrix} = -15+6+60-50-4+27 = 24$$

$$\Delta_1 = \begin{vmatrix} -8 & -4 & 2 \\ -2 & 5 & -3 \\ -6 & 3 & -1 \end{vmatrix} = -48$$

$$\Delta_2 = \begin{vmatrix} 3 & -8 & 2 \\ 1 & -2 & -3 \\ 5 & -6 & -1 \end{vmatrix} = 72$$

$$\Delta_3 = \begin{vmatrix} 3 & -4 & -8 \\ 1 & 5 & -2 \\ 5 & 3 & -6 \end{vmatrix} = 120$$

$$x = \frac{\Delta_1}{\Delta} = \frac{-48}{24} = -2$$

$$y = \frac{\Delta_2}{\Delta} = \frac{72}{24} = 3$$

$$z = \frac{\Delta_3}{\Delta} = \frac{120}{24} = 5$$

Answer:
$x = -2$