Cramer's Rule

Problem: 3. $-9x + 6y + 7z = 182$

$200x + 300y - z = 1082$

$-900x - 600y + 70z = 2008$

Solution:

Here,

$$\begin{bmatrix} -9 & 6 & 7 \\ 200 & 300 & -1 \\ -900 & -600 & 70 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 182 \\ 1082 \\ 2008 \end{bmatrix}$$

$$\therefore A = \begin{bmatrix} -9 & 6 & 7 \\ 200 & 300 & -1 \\ -900 & -600 & 70 \end{bmatrix}$$

$\therefore$ Diterminat of $[A] = |A| =$

$$-9(21000-600) - 6(14000-900) + 7(120000+270000)$$

$$= 787800$$

$$\therefore x = \frac{\begin{vmatrix} 182 & 6 & 7 \\ 1082 & 300 & -1 \\ 2008 & -600 & 70 \end{vmatrix}}{|A|}$$

$$= \frac{182(21000-600) - 6(75740+2008) + 7(-649200-602400)}{787800}$$

$$= \frac{-5514888}{787800}$$

$$= -7.00037$$