

3. If the system of linear equations

$$x - 4y + 7z = g$$

$$3y - 5z = h$$

$$-2x + 5y - 9z = k \quad \text{is consistent, then}$$

(a) $2g + h + k = 0$

(b) $g + 2h + k = 0$

(c) $g + h + k = 0$

(d) $g + h + 2k = 0$

Solⁿ

$$D = \begin{vmatrix} 1 & -4 & 7 \\ 0 & 3 & -5 \\ -2 & 5 & -9 \end{vmatrix}$$

$$= 1(-27 + 25) + 4(0 - 10) + 7(0 + 6)$$

$$= 0$$

\therefore system of linear equation have infinite many solⁿs

$$D = 0 \Rightarrow D_1 = D_2 = D_3 = 0$$

$$D_1 = 0 = \begin{vmatrix} g & -4 & 7 \\ h & 3 & -5 \\ k & 5 & -9 \end{vmatrix} = 0$$

$$\Rightarrow g(-27 + 25) + 4(-9h + 5k) + 7(5h - 3k) = 0$$

$$\Rightarrow -2g - 36h + 20k + 35h - 21k = 0$$

$$\Rightarrow -2g + (-h) - k = 0$$

$$\Rightarrow 2g + h + k = 0$$