

1. If the system of linear equations

$$2x + 2y + 3z = a$$

$$3x - y + 5z = b$$

$$x - 3y + 2z = c$$

$$a, b, c \in \mathbb{R} - \{0\}$$

has more than one solution, then

(a) $b - c - a = 0$

(c) $a + b + c = 0$

(b) $b - c + a = 0$

(d) $b + c - a = 0$

as we know; if

$$a_1x + b_1y + c_1z = d_1$$

$$a_2x + b_2y + c_2z = d_2$$

$$a_3x + b_3y + c_3z = d_3$$

has more than one solution then $D = 0$ and

$$D_1 \neq D_2 = D_3 = 0$$

$$\Rightarrow D_1 = 0 = \begin{vmatrix} a & 2 & 3 \\ b & -1 & 5 \\ c & -3 & 2 \end{vmatrix} = 0 = \begin{vmatrix} d_1 & b_1 & c_1 \\ d_2 & b_2 & c_2 \\ d_3 & b_3 & c_3 \end{vmatrix}$$

$$\Rightarrow a(-2+15) - 2(2b-5c) + 3(-3b+c) = 0$$

$$\Rightarrow 13a - 4b + 10c - 9b + 3c = 0$$

$$D=0 \Rightarrow D_1=0 \Rightarrow 13a - 13b + 13c = 0$$

$$\Rightarrow a - b + c = 0 \Rightarrow b - a - c = 0$$