If the system of linear equations $2x + 3y - z = 0$; $x + ky - 2z = 0$ &

$2x - y + z = 0$, has a non-trivial solution (x, y, z), then $\frac{x}{y} + \frac{y}{z} + \frac{z}{x} + k$ is equal to:

Solution:

So, the equations will be:

$$2x + 3y - z = 0 \cdots (i)$$

$$x + \frac{9}{2}y - 2z = 0 \cdots (ii)$$

$$2x - y + z = 0 \cdots (iii)$$

$(i) - (iii): 4y = 2z \qquad\qquad \Rightarrow \frac{y}{z} = \frac{1}{2}$

$(i) + (iii): 4x + 2y = 0 \qquad \Rightarrow \frac{x}{y} = -\frac{1}{2}$

$(i) + 3(iii): 8x + 2z = 0 \qquad \Rightarrow \frac{z}{x} = -4$

$$\frac{x}{y} + \frac{y}{z} + \frac{z}{x} + k = \frac{1}{2}$$