Related Questions with Solutions

Questions

Quetion: 01

The number of real values of λ for which the system of linear equations
$2x + 4y - \lambda z = 0, 4x + \lambda y + 2z = 0, \lambda x + 2y + 2z = 0$ has infinitely many solutions, is

A. 0
B. 1
C. 2
D. 3

Solutions

Solution: 01

Let $A = \begin{bmatrix} 2 & 4 & -\lambda \\ 4 & \lambda & 2 \\ \lambda & 2 & 2 \end{bmatrix}$

For infinitely many solutions,
$|A| = 0$

$$\Rightarrow \begin{vmatrix} 2 & 4 & -\lambda \\ 4 & \lambda & 2 \\ \lambda & 2 & 2 \end{vmatrix} = 0$$

$\Rightarrow 2(2\lambda - 4) - 4(8 - 2\lambda) - \lambda \left(8 - \lambda^2\right) = 0$

$\Rightarrow \quad \lambda^3 + 4\lambda - 40 = 0$

$\therefore$ Number of values of $\lambda = 1 \quad \left(\because \quad \lambda(3) \cdot \lambda(4) < 0\right)$

Correct Options

Answer:01
Correct Options: B