The set of all values of λ for which the system of equations $x-2y-2z=\lambda x; x+2y+z=\lambda y; -x-y=\lambda z$ has a non –trivial solution

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Solution:

$$|A| = \begin{vmatrix} 1-\lambda & -2 & -2 \\ 1 & 2-\lambda & 1 \\ 1 & 1 & \lambda \end{vmatrix} = 0$$

$$(1-\lambda)(\lambda(2-\lambda)-1)+2(\lambda-1)-2(1+\lambda-2)=0$$

$$\Rightarrow \lambda^3-3\lambda^2+3\lambda-1=0$$

$$\Rightarrow (\lambda-1)^3=0$$

$$\Rightarrow \lambda=1$$

A. Is a singleton

B. Contains exactly two elements

C. Is an empty set

D. Contains more than two elements

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