Related Questions with Solutions

Questions

Quetion: 01

The number of values of k , for which the system of equations
$(k+1)x + 8y = 4k, kx + (k+3)y = 3k - 1$ has no solution, is

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

Solutions

Solution: 01

The matrix equation is $\begin{bmatrix} k+1 & 8 \\ k & k+3 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4k \\ 3k-1 \end{bmatrix}$

For no solution of $AX = B$ a necessary condition is det $A = 0$.

$\Rightarrow \begin{vmatrix} k+1 & 8 \\ k & k+3 \end{vmatrix} = 0$

$\Rightarrow (k+1)(k+3) - 8k = 0 \Rightarrow k^2 + 4k + 3 - 8k = 0$

$\Rightarrow k^2 - 4k + 3 = 0 \Rightarrow (k-1)(k-3) = 0 \therefore k = 1, 3$

For $k = 1$, the equation becomes
2x + 8y = 4, x + 4y = 2
which is just a single equation in two variables, *i.e.*, x + 4y = 2 and it has infinite solutions.
For $k = 3$, the equation becomes
4x + 8y = 12, 3x + 6y = 8
which are parallel lines. So no solution in this case

Correct Options

Answer:01
Correct Options: A