HOMOGENEOUS SYSTEM OF EQUATIONS

The system of equations

$$a_1 x + b_1 y = 0$$
$$a_2 x + b_2 y = 0$$

(i) When $\dfrac{a_1}{a_2} \neq \dfrac{b_1}{b_2}$ then $x = 0$ and $y = 0$

(ii) When $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2}$ then an infinite many number

of solutions (Non zero solutions).

Q. Find the value of K for which the system of equations

$$3x + 5y = 0$$
$$Kx + 10y = 0 \quad \text{has nonzero solution}$$

solution:- If equations having nonzero solution

then $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2}$

$\Rightarrow \dfrac{3}{K} = \dfrac{5}{10_2}$

$\therefore K = 6$ Hence the required value of K = 6 Aus

Q. find the value of K for which each of the following system of equations has no solution

(i) $8x + 5y = 9$ (II) $Kx + 3y = K - 3$ (III) $Kx + 3y = 3$
    $Kx + 10y = 15$ $12x + Ky = K$ $12x + Ky = 6$

Q find the value of K for which the system of equations has a nonzero solution.

(i) $5x - 3y = 0$ (ii) $4x - 3y = 0$