

CHAPTER 03

Pair of Linear Equations in Two Variables

Relation between coefficients and nature of system of equations:

Let a_1, b_1, c_1 and a_2, b_2, c_2 denote the coefficients of a given pair of linear equations in two variables. Then

compare the values of $\frac{a_1}{a_2}, \frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$. This results we can write as “Tabular form” as follows.

Pair of lines	$\frac{a_1}{a_2}$	$\frac{b_1}{b_2}$	$\frac{c_1}{c_2}$	Comparison of ratios	Algebraic interpretation	Graphical interpretation	Solutions
$4x - y = 13 = 0,$ $5x + y - 14 = 0$	$\frac{4}{5}$	$\frac{-1}{1}$	$\frac{13}{14}$	$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$	Consistent and Independent	Intersecting	One solution
$2x - 3y - 5 = 0,$ $4x - 6y - 15 = 0$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$	Inconsistent	Parallel	No solution
$3x + 4y - 2 = 0,$ $6x + 8y - 4 = 0$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$	Consistent and Dependent	Coincident	Infinitely many solutions