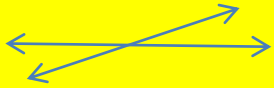


CONCEPT MAP

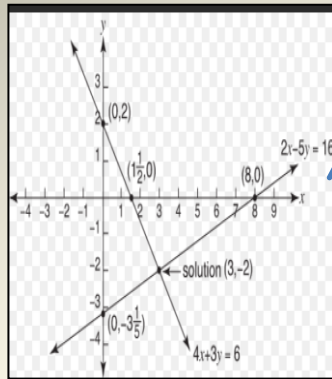
a. Intersecting lines



b. Parallel lines



c. Coincident lines



**PAIR OF LINEAR EQUATIONS
IN TWO VARIABLES**

$$a_1x + b_1y + c_1 = 0; a_1^2 + b_1^2 \neq 0$$

$$a_2x + b_2y + c_2 = 0; a_2^2 + b_2^2 \neq 0$$

METHODS TO SOLVE

GRAPHICAL METHOD

ALGEBRAIC METHOD

**SUBSTITUTION
METHOD**

**ELIMINATION
METHOD**

**CROSS
MULTIPLICATION
METHOD**

**CONDITIONS OF SOLVABILITY OF
PAIR OF LINEAR EQUATIONS**

CONDITION	TYPE OF SOLUTION	GRAPHICAL REPRESENTATION	TYPE OF SYSTEM
$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$	Unique solution	Intersecting lines	consistent
$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$	Infinitely many solutions	Coincident lines	consistent
$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$	No solution	Parallel lines	inconsistent

Steps to solve the pair of linear equations by method of Substitution.

Step1: Obtain two equations, and write them both in standard form

$$a_1x + b_1y + c_1 = 0 \dots (i)$$

$$a_2x + b_2y + c_2 = 0 \dots (ii)$$

Step2: Choose either of the two equations, say (i) and find the value of one variable, say x in terms of y

Step3: Substitute the value of x, obtained in the previous step in equation (ii) to get an equation in one variable y

Step4: Solve the linear equation in one variable obtained in the previous step to get the value of y

Step5: Now do back substitution of y and get the value of x

Step6: check the solution and write the solution set.

Steps to solve the pair of linear equations by method of Elimination

Step1: Obtain two equations, and write them both in standard form

$$\begin{cases} a_1x + b_1y + c_1 = 0 \dots (i) \\ a_2x + b_2y + c_2 = 0 \dots (ii) \end{cases}$$

Step2: make the coefficient of one pair of variable terms (multiply one or both equations by appropriate number so that the sum or difference of coefficients of either X or Y will be zero)

Step3: add or subtract the new equations to eliminate a variable

Step4: solve the linear equation in one variable X or Y obtained in step 3

Step 5: substitute the value of X or Y obtained in step 4 into either of the original equations and solve for the other value.

Step6: check the solution and write the solution set.

x	y	1
Coefficient of y	Constant term	Constant term
Coefficient of x	Coefficient of x	Coefficient of y
$\frac{b_1}{b_2} \neq \frac{c_1}{c_2}$	$\frac{c_1}{c_2} \neq \frac{a_1}{a_2}$	$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$
$\frac{b_1}{b_2} = \frac{c_1}{c_2} = \frac{a_1}{a_2}$	$\frac{c_1}{c_2} = \frac{a_1}{a_2} = \frac{b_1}{b_2}$	$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$