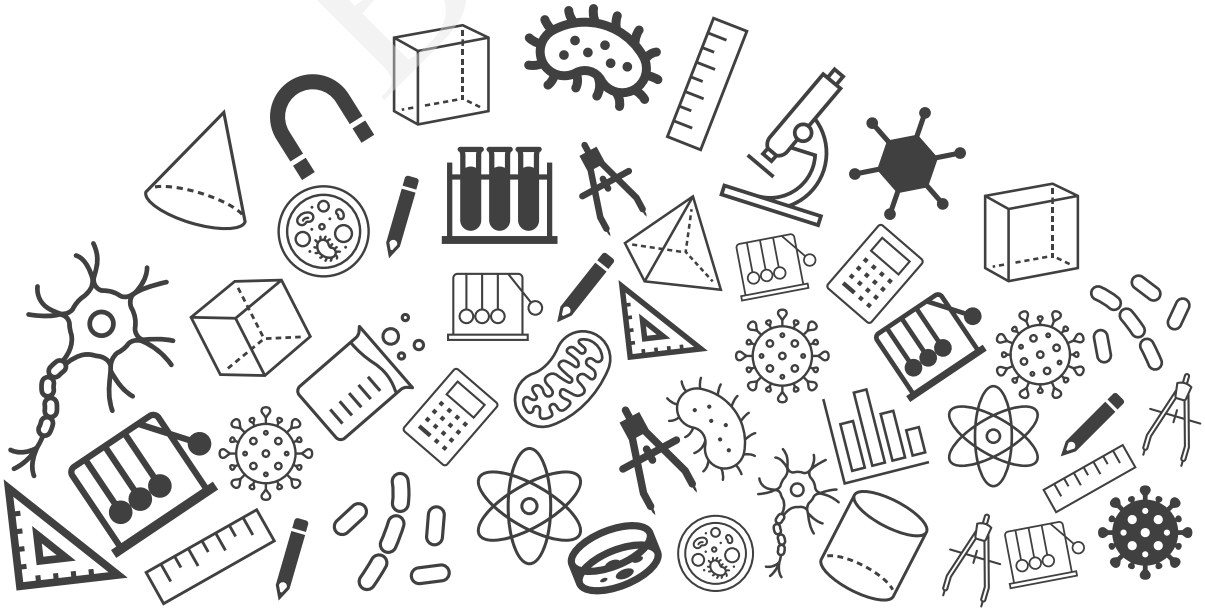
Grade 10
Mathematics Chapter Notes



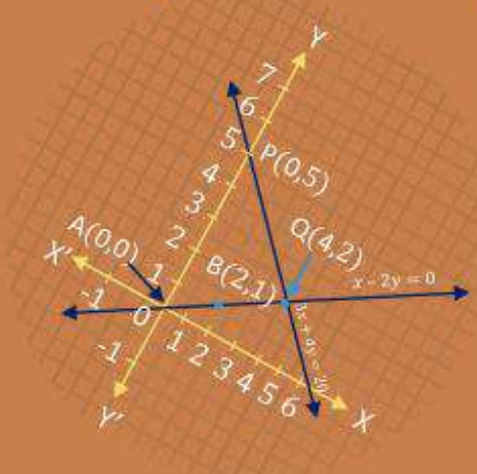
BYJU'S

CHAPTER NOTES

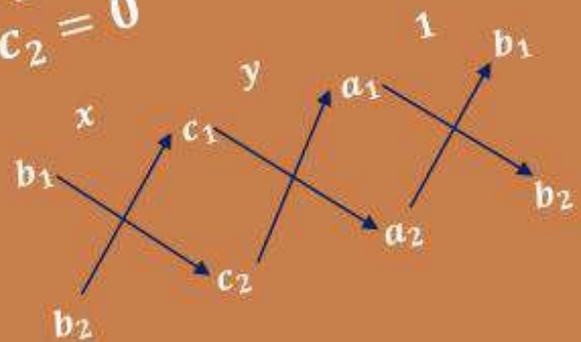
Pair of Linear Equations in Two Variables

Topics

1. General Form of a Linear Equation
2. Types of Pairs of Linear Equations
3. Methods of Solving Pairs of Linear Equations



$$a_1x + b_1y + c_1 = 0$$
$$a_2x + b_2y + c_2 = 0$$



1. Linear Equations in Two Variables

General Form

Coefficients

Constant

$$ax + by + c = 0$$

Variables

where, a and b are non-zero real numbers

Pair of Linear Equations in Two Variables

Consider two different equations in x and y,

$$2x + 7y + 5 = 0$$

$$8x + 3y + 3 = 0$$

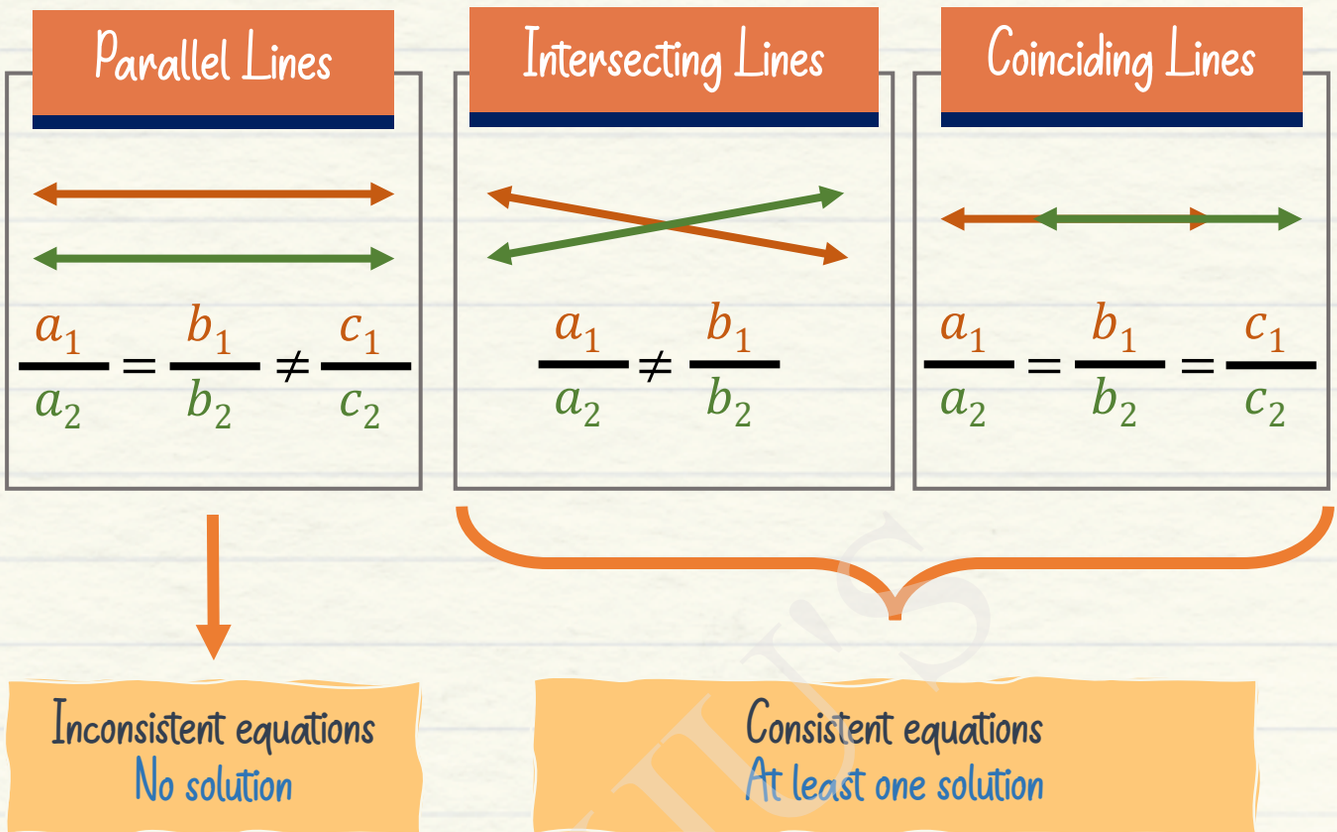
These two combined are known as pair of **linear equations** in two variables.

General Form of Pair of Linear Equations in Two Variables

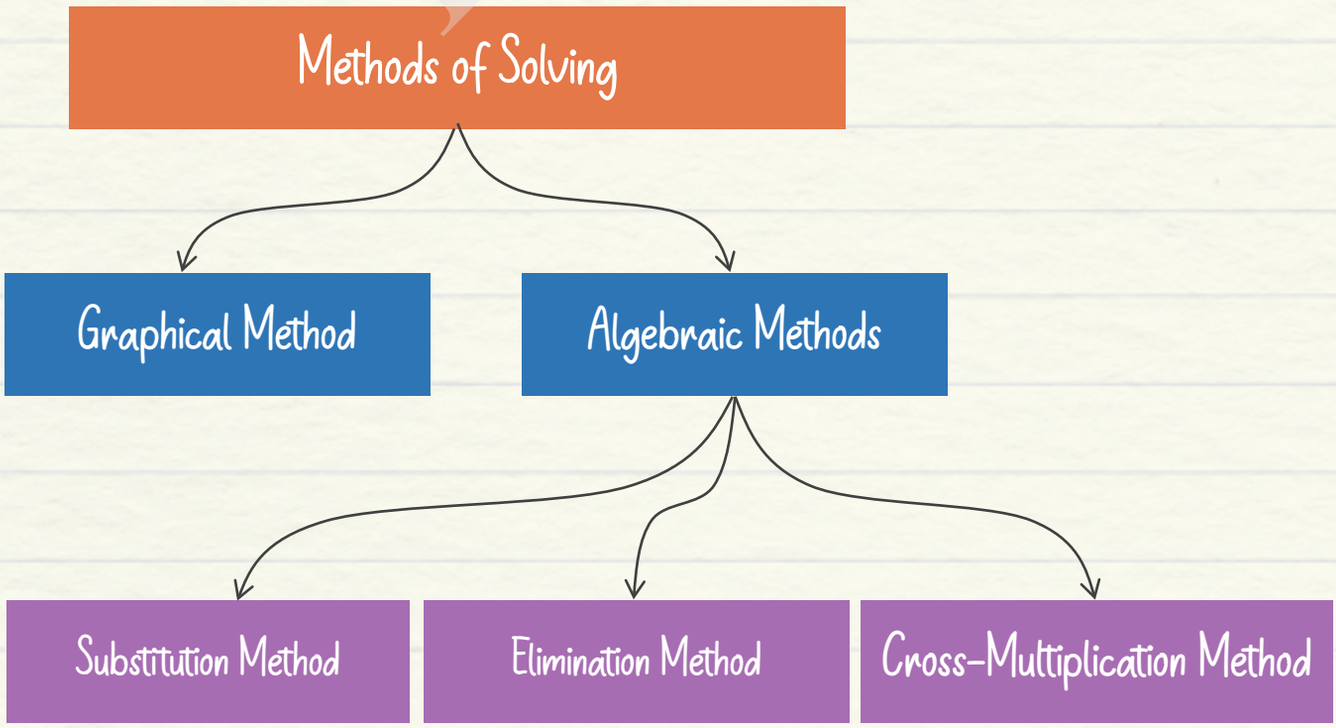
$$a_1x + b_1y + c_1 = 0$$

$$a_2x + b_2y + c_2 = 0$$

2. Types of Pairs of Linear Equations



3. Methods of Solving Pairs of Linear Equations



3.1 Graphical Method

$2x - 1y = -1$, $3x + 2y = 9$

Find points to construct lines on a graph paper for the two given equations

To construct a line, we need at least two point of the line, we find the value substituting values of x and y in the two equations.

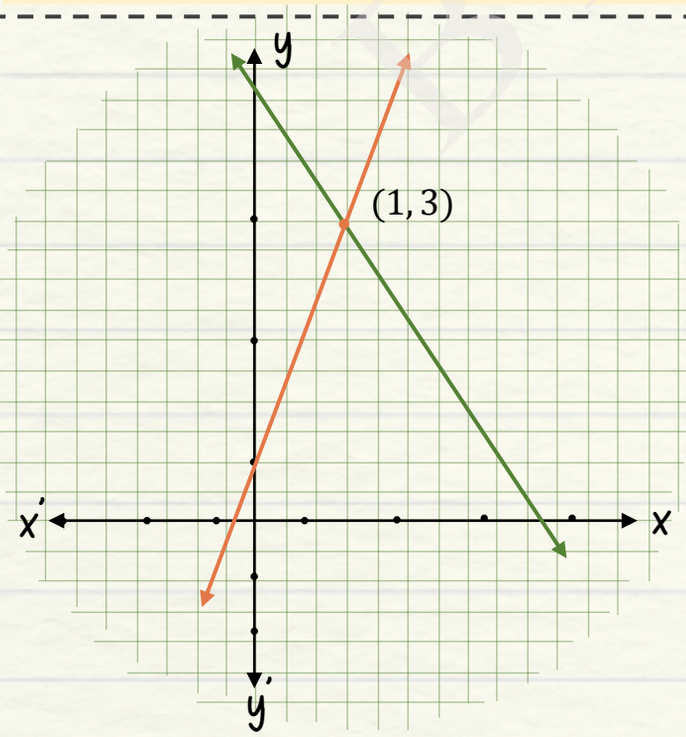
$2x - 1y = -1$

x	0	$-\frac{1}{2}$	1
y	1	0	3

$3x + 2y = 9$

x	0	3	1
y	$\frac{9}{2}$	0	3

Draw the two line on a graph and mark the points at which they intersect.



The x-coordinate and the y-coordinate of the point at which the two lines intersect is the solution(s) of the pair of equations.

3.2 Substitution Method

$$x + y = 4 \quad , \quad x - y = 2$$

Take one of the equations and move 'y' to LHS and the rest to RHS to get the value of 'y' in terms of 'x'.

$$y = 4 - x$$

Substitute the obtained value of 'y' in the other equation to get the numerical value of 'x'.

$$x - y = 2$$
$$x - (4 - x) = 2$$
$$2x - 4 = 2$$
$$x = 3$$

Now, substitute the obtained value of 'x' in either of the equations to get the value of 'y'.

$$x + y = 4$$
$$3 + y = 4$$
$$y = 1$$

3.3 Elimination Method

$3x + 2y = 18$, $5x + 4y = 32$

1 Note down equations aligned to respective variables as shown.

$+3x$	$+2y$	$=$	$+18$
$+5x$	$+4y$	$=$	$+32$

2 Pick the variable which will be easier to eliminate.

$+3x$	$+2y$	$=$	$+18$
$+5x$	$+4y$	$=$	$+32$

3 Equalise the coefficients of the variable to be eliminated by multiplying every term of the equation with the same number.

$+3x$ $\times 2$	$+2y$ $\times 2$	$=$	$+18$ $\times 2$
$+5x$	$+4y$	$=$	$+32$

4 Subtract the second equation from the first equation by reversing all the signs.

$+6x$	$+4y$	$=$	$+36$
$-5x$	$-4y$	$=$	-32
$+x$	$+0y$	$=$	$+4$

5 Substitute the value of the now known variable into the simpler equation to get the value of the other variable.

We know that,

$x = 4$

And, $3x + 2y = 18$

$\Rightarrow 3 \times 4 + 2y = 18$

$\Rightarrow 12 + 2 = 18$

$\Rightarrow 2y = 6$

$\Rightarrow y = 3$

From the above, x = 4 and y = 3.
Therefore, (4,3) is the solution of the simultaneous equations
"3x + 2y = 18" and
"5x + 4y = 32".

6 Verify the values obtained for x and y by putting them in the given equations

$3x + 2y = 18$,

LHS $= 3x + 2y$

$= 3 \times 4 + 2 \times 3$

$=$ RHS

$5x + 4y = 32$

LHS $= 5x + 4y$

$= 5 \times 4 + 4 \times 3$

$=$ RHS

Mind Map

General Form of a Linear Equation

Types of Pairs of Linear Equations

Pair of Linear Equations in Two Variables

Methods of Solving Pairs of Linear Equations

Graphical Method

Algebraic Method