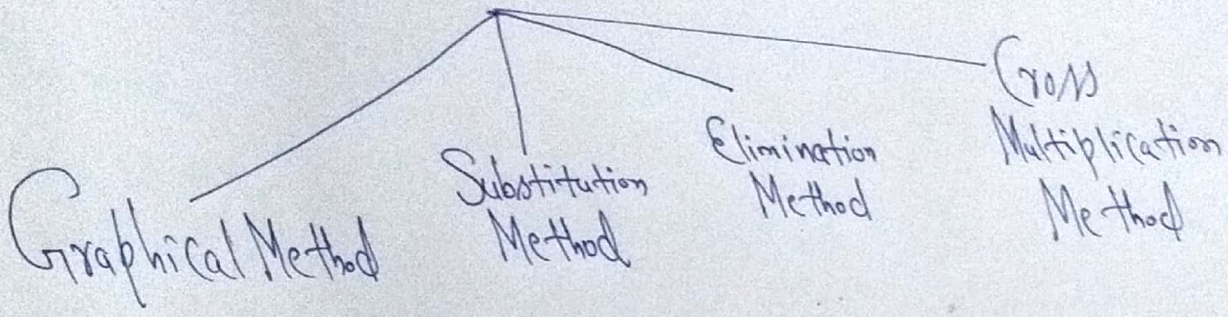
Pair of Linear Eqn in Two Variable

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

Method to Solve



Substitution Method – Substitute the value of any variable from one eqn to other.

Ex – Solve $x + y = 6$ –(i)

$x - y = 2$ –(ii)

From (i) $y = 6 - x$ Put in Eqn(ii)

$$x - (6 - x) = 2$$
$$x - 6 + x = 2$$
$$2x = 2 + 6$$
$$2x = 8 \quad \text{So } \boxed{x = 4}$$

So $y = 6 - 4$

$$\boxed{y = 2}$$

Elimination Method - In this method we Equate the Coefficient of Variable.

Ex - ① $x + y = 6$ -(i)

$x - y = 2$ -(ii)

On add $2x = 8$

$\boxed{x = 4}$

by Eqn (i)

So $4 + y = 6$

$\boxed{y = 2}$

Ex-2 $2x + 3y = 5$ -(i)

$x + 2y = 3$ -(ii)

Multiply Eqn (ii) by 2

$2x + 4y = 6$

And Eqn (i) $2x + 3y = 5$

$y = 1$

by Eqn (i)

$2x + 3 \times 1 = 5$ So $2x = 2$

$\boxed{x = 1}$

Cross Multiplication Method

$a_1x + b_1y = c_1$

$a_2x + b_2y = c_2$

$b_1 \times c_1 \times a_1 \times b_1$

$b_2 \quad c_2 \quad a_2 \quad b_2$

$$\frac{x}{b_1c_2 - b_2c_1} = \frac{y}{c_1a_2 - c_2a_1} = \frac{-1}{a_1b_2 - a_2b_1}$$

Ex- $x + y = 6$

$x - y = 2$

$1 \times 6 \times 1 \times 1$

$-1 \quad 2 \quad 1 \quad -1$

$$\frac{x}{2+6} = \frac{y}{6-2} = \frac{-1}{-1-1}$$

So $\frac{x}{8} = \frac{y}{4} = \frac{+1}{+2}$

$x = \frac{8}{2}$ $y = \frac{4}{2}$ So

$\boxed{x = 4}$ $\boxed{y = 2}$

Word problems

Ex-3.3

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(i) Suppose larger no = x
Smaller = y

$x - y = 26$ -(i)

$x = 3y$

$x - 3y = 0$ -(ii)

(ii) Suppose Supplementary Angles = x, y

$x = y + 18$

or $x - y = 18$ -(i)

And $x + y = 180$ -(ii)

(iii) Suppose Cost of 1 bat = x
" " 1 ball = y

$7x + 6y = 3800$ -(i)

$3x + 5y = 1750$ -(ii)

2017

(iv) Suppose fixed charge = x
Per km charge = y

for 10 km $x + 10y = 105$ -(i)

for 15 km $x + 15y = 155$ -(ii)

(v) Suppose N = x, D = y, fraction = $\frac{x}{y}$

I st $\frac{x+2}{y+2} = \frac{9}{11}$

$11x + 22 = 9y + 18$

So $11x - 9y = -4$ -(i)

II nd $\frac{x+3}{y+3} = \frac{5}{6}$

$6x + 18 = 5y + 15$

$6x - 5y = -3$ -(ii)

2014
2015, 2016, 2017, 2019

(vi) Age of Jacob = x
" " Son = y

I st 5 yr hence $x + 5 = 3(y + 5)$

$x + 5 = 3y + 15$

$x - 3y = 10$ -(i)

II nd 5 yr ago $x - 5 = 7(y - 5)$

$x - 5 = 7y - 35$

$x - 7y = -30$ -(ii)