

DAY-5



Basic MATHS

EQN. IN 2 VARIABLE





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Equations in 2 variables

Equations involving 2 distinct variables of highest power 1 is known as Linear equation in 2 variables.

Ex. $x + 2y = - 2$

NOTE:

To solve and get the value of two variables in a linear equation we need 2 different equations.



Solving Equations in 2 variables

NOTE:

To solve and get the value of two variables in a linear equation we need 2 different equations.

$$x + y = 3$$

$$x - y = 1$$



Elimination Method

Alag signs \rightarrow Addition
Same signs \rightarrow Subtraction

$$\begin{array}{r} x + y = 3 \text{ --- } \textcircled{1} \\ x - y = 1 \text{ --- } \textcircled{2} \end{array}$$

$$\begin{array}{r} x + y = 3 \\ + \quad x - y = 1 \\ \hline \end{array}$$

$$\underbrace{1x + 1x = 2x}$$

$$+y - y$$

$$(x, y) = (2, 1)$$

$$\begin{array}{r} 2x = 4 \\ x = \frac{4}{2} = 2 \end{array}$$

$$\boxed{x = 2}$$

$$\begin{array}{r} 2 + y = 3 \\ y = 3 - 2 = 1 \end{array}$$

$$\boxed{y = 1}$$



Elimination Method

Mag → Add

✓ $8x + 3y = 11$ ——— ①

$3x - 1y = 2$ ——— ② →
x3

$3(3x - 1y) = 2 \times 3$

$9x - 3y = 6$ ——— ③

$8(1) + 3y = 11$
 $3y = 11 - 8$
 $3y = 3$
 $y = 1$ ✓

$8x + 3y = 11$
 $+ 9x - 3y = 6$
—————

$17x = 17$

$x = \frac{17}{17} = 1$

✓
 $x = 1$



Elimination Method (ASA)

$$\begin{array}{r} 4x + y = 34 \quad \text{--- (i)} \\ 4x + x + 4y = 16 \quad \text{--- (ii)} \end{array}$$

$$\begin{array}{r} 4x + y = 34 \\ + x + 4y = 16 \\ \hline 5x + 5y = 50 \\ \boxed{x + y = 10} \quad \text{--- (iii)} \end{array}$$

$$\begin{array}{r} 8 + y = 10 \\ y = 10 - 8 \\ \boxed{y = 2} \end{array}$$

$$\begin{array}{r} 4x + y = 34 \\ - x + 4y = 16 \\ \hline 3x - 3y = 18 \\ \boxed{x - y = 6} \quad \text{--- (iv)} \end{array}$$

Add (iii) & (iv)

$$\begin{array}{r} x + y = 10 \\ + x - y = 6 \\ \hline 2x = 16 \\ \boxed{x = 8} \end{array}$$



TIP

Represent 2 digit number in terms of x and y

$$'xy' \rightarrow 10x + y$$

Interchange \rightarrow $yx \rightarrow 10y + x$

is/are/was/will

'x'

'y'



In an envelope there are some 5 rupee notes and some 10 rupee notes. Total amount of these notes together is 350 rupees. Number of 5 rupee notes are less by 10 than number of 10 rupee notes. Then find the number of 5 rupee and 10 rupee notes.

$$5x + 10y = 350$$

$$x + 2y = 70 \text{ ————— (i)}$$

$$30 + 2y = 70$$

$$2y = 70 - 30$$

$$x + 2y = 70$$

$$+ x - 2y = -10$$

$$2x = 60$$

$$x = 2y - 10$$

$$2y = 40$$

$$x - 2y = -10 \text{ ————— (ii)}$$

$$y = \frac{40}{2}$$

$$x = 30$$

$$y = 20$$



The price of 3 chairs and 2 tables is 4500 rupees and price of 5 chairs and 3 tables is 7000 rupees, then find the total price of 2 chairs and 2 tables.

x

y

$$3x + 2y = 4500 \text{ --- (i) } \times 3$$

$$5x + 3y = 7000 \text{ --- (ii) } \times 2$$

$$\underline{\underline{3(500) + 2y = 4500}}$$

$$1500 + 2y = 4500$$

$$2y = 4500 - 1500$$

$$2y = 3000$$

$$y = \frac{3000}{2} = 1500$$

$$9x + \cancel{6y} = 13500$$

$$10x + \cancel{6y} = 14000$$

$$+1x = +500$$

$$\boxed{x = 500}$$

$$2x + 2y$$

$$= 1000$$

$$+ 3000$$

$$= 4000$$



$$\frac{x}{3} + \frac{y}{4} = 4; \quad \frac{x}{2} - \frac{y}{4} = 1$$

$$\frac{x}{2} - \frac{y}{4} = 1 \quad \text{LCM} = \underline{\underline{4}}$$

$$2 \times 4 \left(\frac{x}{2} \right) - 4 \left(\frac{y}{4} \right) = 4 \times 1$$

$$2x - y = 4 \quad \text{--- (II)}$$

$$\frac{x}{3} + \frac{y}{4} = 4$$

$$3 \times 4 = 12$$

$$4 \times \left(\frac{x}{3} \right) + 3 \times \left(\frac{y}{4} \right) = 12 \times 4$$

$$4x + 3y = 48 \quad \text{--- (I)}$$



Let $\frac{1}{x} = m$ $\frac{1}{y} = n$

$$\frac{4}{x} + \frac{5}{y} = 7; \quad \frac{3}{x} + \frac{4}{y} = 5$$

SUBSTITUTION

$$4 \times \frac{1}{x} + 5 \times \frac{1}{y} = 7$$

$$4m + 5n = 7 \quad \text{--- (i)}$$

(x3)

$$3 \times \frac{1}{x} + 4 \times \frac{1}{y} = 5$$
$$3m + 4n = 5 \quad \text{--- (ii)}$$

(x4)

$$\begin{array}{r} 12m + 15n = 21 \\ - 12m + 16n = 20 \\ \hline + 31n = 1 \end{array}$$

$n = -1$
 $\frac{1}{y} = -1$
 $y = -1$
 $y = 1$

$$4m + 5(-1) = 7$$
$$4m + (-5) = 7$$
$$4m - 5 = 7$$

$$4m = 7 + 5$$
$$4m = 12$$

$m = 3$

$n = -1$

$$m = 3$$
$$\frac{1}{x} = 3$$
$$1 = 3x$$

$\frac{1}{3} = x$



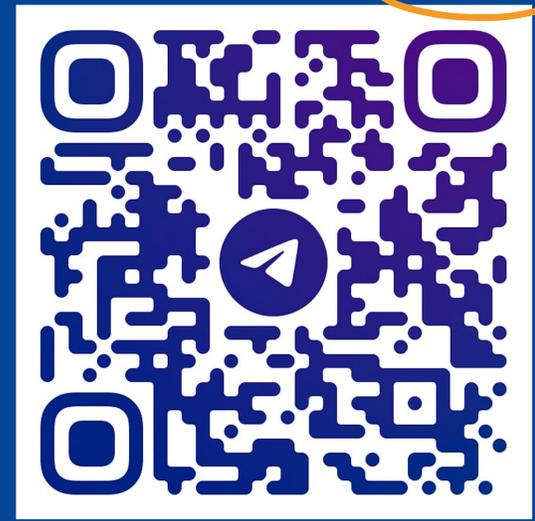
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