

Elimination method (chapter: 3) 10th class

NITISH KUMAR



Solve the following pair of linear equations by the elimination method

$$\underline{x + y = 5} \text{ and } \underline{2x - 3y = 4}$$

$$\frac{a_1}{a_2} = \frac{1}{2}$$

$$\frac{b_1}{b_2} = \frac{1}{-3}$$

$$\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \left[\text{unique} \right]$$

$$\underline{x + y = 5} \text{ --- (I)}$$

$$\underline{2x - 3y = 4} \text{ --- (II)}$$

multiplying equation (I) by (3)

$$3(x + y = 5) \Rightarrow \underline{3x + 3y = 15} \text{ --- (III)}$$

adding (II) and (III)

$$\begin{array}{r} 2x - 3y = 4 \\ 3x + 3y = 15 \\ \hline \end{array}$$

$$5x = 19$$

$$5x = 19 \Rightarrow x = \frac{19}{5}$$

Put the value of equation (II) in equation (I)

$$x + y = 5$$

$$\frac{19}{5} + y = 5$$

$$y = 5 - \frac{19}{5}$$

$$y = \frac{5 \times 5 - 19}{5}$$

$$y = \frac{25 - 19}{5}$$

$$\Rightarrow y = \frac{6}{5}$$



Solve the following pair of linear equations by the elimination method

$$\frac{x}{2} + \frac{2y}{3} = -1 \text{ and } x - \frac{y}{3} = 3$$

$$\frac{a_1}{a_2} = \frac{\frac{1}{2}}{1} = \frac{1}{2}, \quad \frac{b_1}{b_2} = \frac{\frac{2}{3}}{-\frac{1}{3}} = \frac{2}{3} \times \frac{-3}{1} = -2$$

$\left[\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \right]$ (Unique)

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

$$3x + 4y = -6$$

6

$$3x + 4y = -6 \quad \text{--- ①}$$

$$x - \frac{y}{3} = 3$$

$$3x - y = 9$$

3

$$(3x) - y = 9 \quad \text{--- ②}$$

Sub. equation ① and ②

$$3x + 4y = -6$$

$$3x - y = 9$$

$$5y = -15$$

$$y = \frac{-15}{5}$$

$$\boxed{y = -3}$$

Using the value of y in ②

$$3x - (-3) = 9$$

$$3x + 3 = 9$$

$$3x = 9 - 3$$

$$3x = 6$$

$$\boxed{x = 2}$$

$$3(2) + 4(-3) = -6$$

$$6 + (-12) = -6$$

$$6 - 12 = -6$$

$$\boxed{-6 = -6}$$



Solve the following pair of linear equations by the elimination method

$$3x - 5y - 4 = 0 \text{ and } 9x = 2y + 7$$

$$\frac{a_1}{a_2} = \frac{3}{9} = \frac{1}{3} \quad \frac{b_1}{b_2} = \frac{-5}{-2} = \frac{5}{2}$$

$$\begin{cases} 3x - 5y = 4 & \text{--- (i)} \\ 9x - 2y = 7 & \text{--- (ii)} \end{cases}$$

Multiplying equation (i) by 3

$$3(3x - 5y = 4) \Rightarrow 9x - 15y = 12 \text{ --- (iii)}$$

Sub. equation (ii) and (iii)

$$\begin{array}{r} 9x - 2y = 7 \\ 9x - 15y = 12 \\ \hline -13y = -5 \end{array}$$

$$y = \frac{-5}{-13} = \frac{5}{13}$$

$$\left(\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \right) \text{ (Unique)}$$

Using $(y = \frac{5}{13})$ in (i)

$$3x - 5\left(\frac{5}{13}\right) = 4$$

$$3x + \frac{25}{13} = 4$$

$$3x = 4 - \frac{25}{13}$$

$$3x = \frac{52 - 25}{13}$$

$$3x = \frac{27}{13}$$

$$x = \frac{27}{3 \times 13}$$

$$x = \frac{9}{13}$$



Five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. How old are Nuri and Sonu?

Let the present age of Nuri = x
 Sonu = y

A.T.O

Five years ago

Nuri's age = $x-5$

Sonu's age = $y-5$

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

$$x-5 = 3y-15$$

$$x-3y = -15+5$$

$$x-3y = -10 \text{ --- (I)}$$

Ten years later

Nuri's age = $x+10$

Sonu's age = $y+10$

$$x+10 = 2(y+10)$$

$$x+10 = 2y+20$$

$$x-2y = 20-10$$

$$x-2y = 10 \text{ --- (II)}$$

$$x-3y = -10 \text{ --- (I)}$$

$$x-2y = 10 \text{ --- (II)}$$

Sub. equation (I) and (II)

$$x-3y = -10$$

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

$$-y = +20$$

$$\rightarrow y = 20 \text{ (15)}$$

Put $y = 20$ in (I)

$$x-3(20) = -10$$

$$x-60 = -10$$

$$x = -10+60$$

$$x = 50$$

$$45$$



A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid ₹ 27 for a book kept for seven days, while Susy paid ₹ 21 for the book she kept for five days. Find the fixed charge and the charge for each extra day.

$$7 - 3 = 4$$

$$5 - 3 = 2$$

Let fixed charge = x
charge per day = y

A.T.O

Saritha :- $x + 4y = 27$ — (i)

Susy :- $x + 2y = 21$ — (ii)

Sub. equation (i) and (ii)

$$\begin{array}{r} x + 4y = 27 \\ -x + 2y = 21 \\ \hline 2y = 6 \end{array}$$

$$2y = 6$$

$$y = 3$$

Put $y = 3$ in (i)

$$x + 4(3) = 27$$

$$x + 12 = 27$$

$$x = 27 - 12$$

$$x = 15$$

$$15 + 2(3)$$

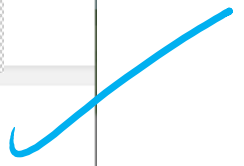
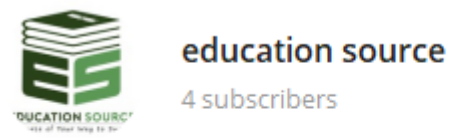
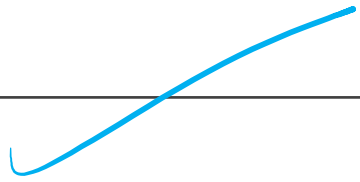
$$15 + 6$$

$$21$$





EDUCATION SOURCE
A Source of Your Way to Success



t.me/educationsource2231
Link

education source

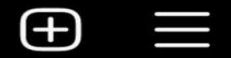
HOME VIDEOS PLAYLISTS CHANNELS



education source

SUBSCRIBED

educationsource.in



4 OF 5 STEPS COMPLETE



51 Posts

620 Followers

0 Following



educationsource.in
Online Tuition classes for 9th-12th
Subject: math's,physics,chemistry,biology.
Co.no. 9041613954, 9468057042
Educationsource94@gmail.com
youtube.com/channel/UCF1KfE0acOn3aGOIqvabUQ
sector 30 B chandigarh, Chandigarh, India, 160030



Edit Profile

Ad Tools

Insights

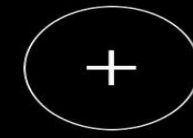
Contact



GK



mathematics



New



30 Posts

215 Followers

179 Following



Nitish kumar shandilya
Education
Online-offline classes for
physics,chemistry,mathematics,biology
9th-12th
Co.No. 9041613954... more
youtube.com/channel/UCF1KfE0acOn3aGOIqvabUQ

