

15. If $3x + 5y + 7z = 49$ and $9x + 8y + 21z = 126$, then what is the value of y ?

यदि $3x + 5y + 7z = 49$ तथा $9x + 8y + 21z = 126$ है, तो y का मान क्या है?

a) 4

b) 2

~~c) 3~~

d) 5

$$3 \times \textcircled{1} - \textcircled{2}$$

$$7y = 147 - 126 = 21$$

$$y = 3$$

coaching center

16. If $3x + 4y - 2z + 9 = 17$, $7x + 2y + 11z + 8 = 23$ and $5x + 9y + 6z - 4 = 18$, then what is the value of $x + y + z - 34$?

यदि $3x + 4y - 2z + 9 = 17$, $7x + 2y + 11z + 8 = 23$ और $5x + 9y + 6z - 4 = 18$ है, तो $x + y + z - 34$ का मान क्या है?

a) -28

b) -24

~~c) -31~~

d) -45

$$\textcircled{1} + \textcircled{2} + \textcircled{3}$$

$$15x + 15y + 15z = 8 + 15 + 22 = 45$$

$$\cancel{15(x+y+z)} = \cancel{45} \div 3$$

coaching center

17. Cost of 4 pens, 6 note books and 9 files is Rs.305. Cost of three pens, 4 notebooks and 2 files is Rs.145. What is the cost (in Rs) of 5 pens, 8 notebooks and 16 files?

4 कलम, 6 नोटबुक तथा 9 फाइल का मूल्य 305 रु है। 3 कलम, 4 नोटबुक तथा 2 फाइल का मूल्य 145 रु है। 5 कलम, 8 नोटबुक तथा 16 फाइल का मूल्य (रु में क्या है)?

a) 415

~~b) 465~~

c) 440

d) Cannot be determined

$$\begin{array}{r} 2 \times (4p + 6n + 9f = 305) \\ - (3p + 4n + 2f = 145) \end{array}$$

$$5p + 8n + 16f = 610 - 145 = 465$$

18. Cost of 8 pencils, 5 pens and 3 erasers is Rs111. Cost of 9 pencils, 6 pens and 5 erasers is Rs130. Cost of 16 pencils, 11 pens and 3 erasers is Rs221. What is the cost of 39 pencils, 26 pens and 13 erasers?

8 पेंसिल, 5 कलम तथा 3 रबड़ का मूल्य 111 रुपये है 9 पेंसिल, 6 कलम तथा 5 रबड़ का मूल्य 130 है 16 पेंसिल, 11 कलम तथा 3 रबड़ का मूल्य 221 रुपये है 39 पेंसिल, 26 कलम तथा 13 रबड़ का मूल्य क्या है?

a) 316

~~b) 546~~

c) 624

d) 482

$$8p + 5pn + 3e = 111$$

$$+ 9p + 6pn + 5e = 130$$

$$+ 16p + 11pn + 3e = 221$$

$$13 \times \left(\frac{33}{3}p + \frac{22}{2}pn + \frac{11}{1}e = \frac{462}{13} \right)$$

546

19. If $x + 3y - \frac{2z}{4} = 6$, $x + \frac{2}{3}(2y + 3z) = 33$ and $\frac{1}{7}(x + y + z) + 2z = 9$, then what is the value of $46x + 131y$?

यदि $x + 3y - \frac{2z}{4} = 6$, $x + \frac{2}{3}(2y + 3z) = 33$ और $\frac{1}{7}(x + y + z) + 2z = 9$ है, तो $46x + 131y$ का मान क्या है?

a) 414

b) 364

c) 384

d) 464

$$2 \times (2x + 6y - z = 12)$$

$$+ 3x + 4y + 6z = 99$$

$$+ x + y + 15z = 63$$

$$46x + 131y = 414$$

no of benches = x

$$5x + 2 = 6(x - 1)$$

$$8 = x$$

Children = 42

50

20. In a room, there are some children and some benches. If 5 children sit on each, 2 children will have no bench to sit on. If 6 Children sit on each bench, then one bench remains unoccupied. What is the sum of the number of children and the number of benches?

एक कमरे में कुछ बच्चे और कुछ बेंच हैं। यदि प्रत्येक बेंच पर 5 बच्चे बैठते हैं, तो 2 बच्चों के बैठने के लिए कोई बेंच नहीं होगी। प्रत्येक बेंच पर 6 बच्चे बैठते हैं, तो एक बेंच खाली रहती है। बच्चों की संख्या और बेंचों की संख्या का योगफल क्या है?

- a) 52 b) 50 ✓
c) 49 d) 53

$$b=0, a=1$$

$$2x + 1 = 0 \Rightarrow x = -\frac{1}{2}$$

$$2y - 4 = 0 \Rightarrow y = 2$$

2). The solution of the following system of equations:

$$2(ax - by) + a + 4b = 0,$$

$2(bx + ay) + b - 4a = 0$, is also the solution of the equation:

दिए गए समीकरणों के निकाय:

$$2(ax - by) + a + 4b = 0,$$

$2(bx + ay) + b - 4a = 0$ का हल, निम्नलिखित में से किस समीकरण का भी हल है?

a) $3x - 2y = 5$

~~b) $4x + 3y = 4$~~

c) $2x - 3y = 6$

d) $3x + 4y = 59$

$-1 - 6$

coaching center

- **Graphical Representation of linear equations**
- **Number of solutions**

(हलों की संख्या)

coaching center

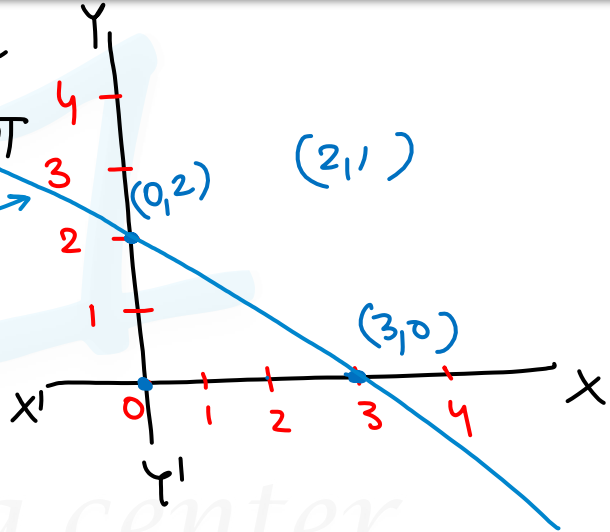
Graphical representation:

Linear \rightarrow line

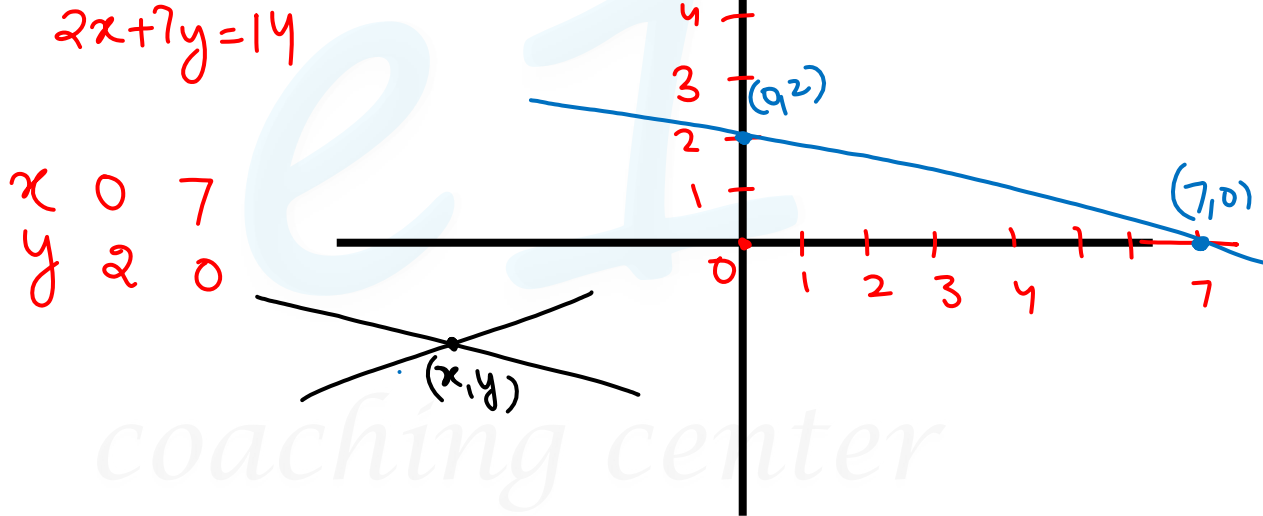
रेखा \rightarrow रैखी

$$2x + 3y = 6$$

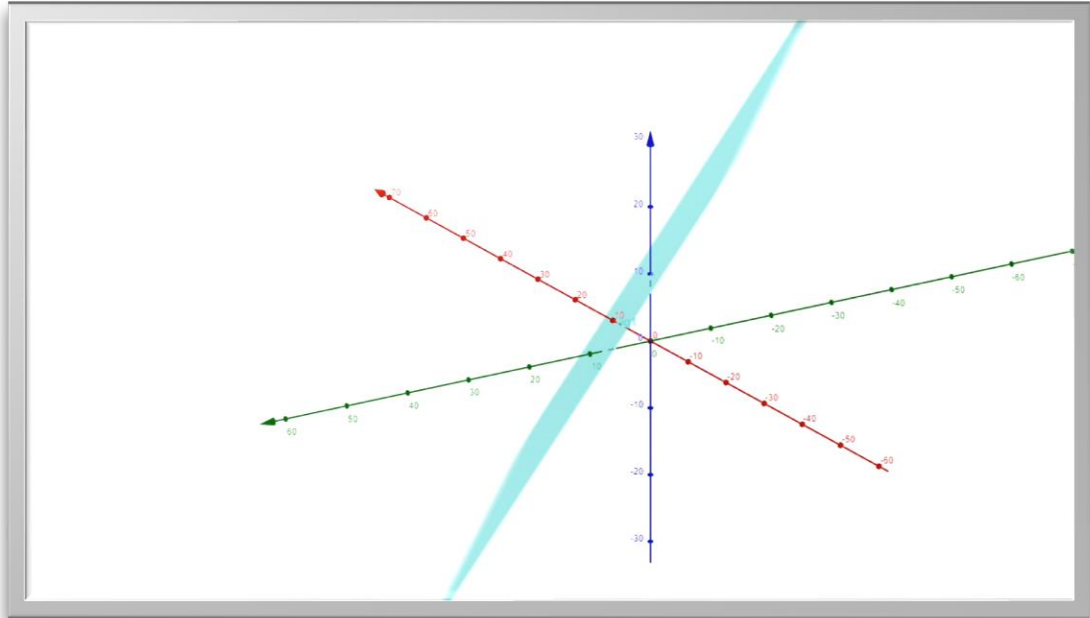
x	0	3
y	2	0



Graph of linear equation in 2 variables:



Graph of linear equation in 3 variables:

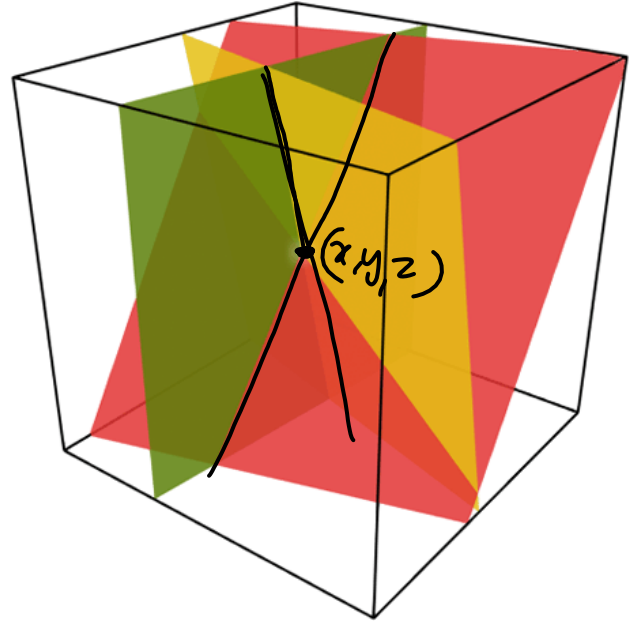


Solution of Linear equations in 3 variables:

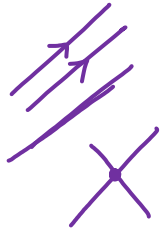
for example'

$$\begin{cases} 2x + 3y + 4z = 0 \\ 3x - y + 5z = 0 \end{cases}$$

($4y + 5z = 8$)



No. of solutions (lin eqn in 2 variables)



$$a_1x + b_1y + c_1 = 0 \rightarrow \text{line}$$

$$a_2x + b_2y + c_2 = 0 \rightarrow \text{line}$$

Case I:  intersecting (पुतिखेदी) one sol

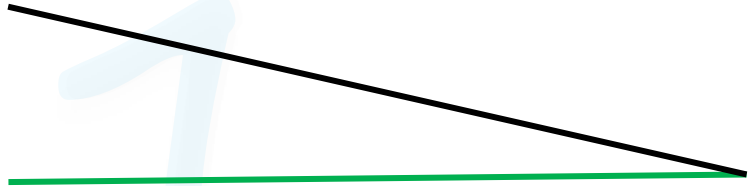
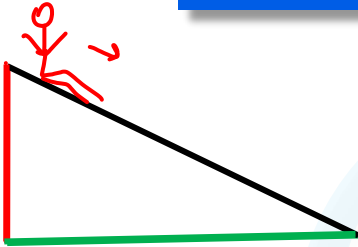
Case II:  coincidental (सपाती) Infinite

Case III:  Parallel (समांतर) No soln

	Slope	distance from origin
Parallel	Same	$3\sqrt{10}$
Coincidental	Same	Same
Intersecting	diff	

coaching center

No. of solutions concept:



e 1
coaching center

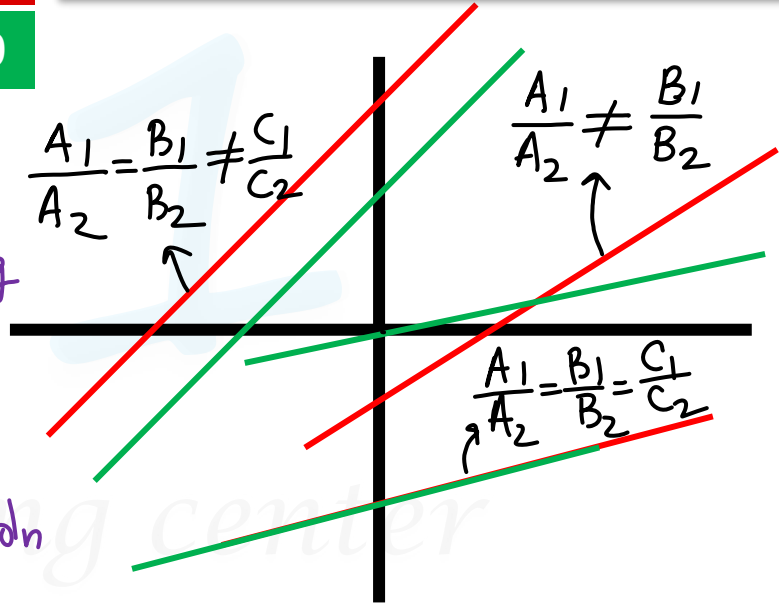
$$A_1x + B_1y + C_1 = 0$$

$$A_2x + B_2y + C_2 = 0$$

No. of solutions concept:

Consistent pair
(संगत युग्म) } Having Soln

Inconsistent pair
(असंगत युग्म) } no Soln



1. The set of equations $4x - 6y = 18$ and $10x - 15y = 45$ has:

समीकरणों $4x - 6y = 18$ और $10x - 15y = 45$ के कितने हल हैं?

a) No solution

b) One solution

c) Two solutions

d) More than two solutions

$$\frac{\cancel{4}^2}{\cancel{10}^2} = \frac{\cancel{18}^2}{\cancel{5}^2} = \frac{\cancel{18}^2}{\cancel{5}^2}$$

i) Coincidental

ii) ∞

iii) Constant

coaching center

2. The lines whose equations are $2x - 5y + 7 = 0$ and $8x - 20y + 28 = 0$ intersect each other how many times?

रेखाएं जिनके समीकरण $2x - 5y + 7 = 0$ और $8x - 20y + 28 = 0$ हैं, एक दुसरे को कितनी बार प्रतिछेदित करती हैं?

a) Not even once

b) One

~~c) Infinite~~

d) Can't say

$$\frac{\cancel{2}}{\cancel{8}} = \frac{\cancel{-5}}{\cancel{-20}} = \frac{\cancel{7}}{\cancel{28}}$$

4 4 4

coaching center

3. The value of 'a' so that the lines $x + 3y - 8 = 0$ and $ax + 12y + 5 = 0$ are parallel:

a का वह मान बताओ जिसके लिए रेखाएं $x + 3y - 8 = 0$ और $ax + 12y + 5 = 0$ समानांतर हैं।

a) 0

b) 1

~~c) 4~~

d) -4

$$y \leftarrow a = \frac{3}{12} \neq \frac{-8}{5}$$

coaching center

4. If the set of equations $6x + 8y = 24$ and $9x + 12y = k$ is consistent, then $k = ?$

अगर समीकरणों $6x + 8y = 24$ and $9x + 12y = k$ का युग्म संगत है तो $k = ?$

a) $k = 12$

b) $k = 16$

c) $k = 24$

~~d) $k = 36$~~

~~OR~~

$\frac{6}{9} \neq \frac{8}{12}$

~~X~~

$\frac{2 \times 6}{3 \times 9} = \frac{2 \times 8}{3 \times 12} = \frac{24}{k}$

$\frac{2 \times 6}{3 \times 9} = \frac{2 \times 8}{3 \times 12}$ (with arrow $\times 12$)

$\frac{2 \times 8}{3 \times 12} = \frac{24}{k}$ (with arrow $\times 12$)

coaching center

5. If the set of equations $x + py = 18$ and $4x + 12y = 30$ has unique solution, then which of the following must be true?

अगर समीकरणों $x + py = 18$ और $4x + 12y = 30$ का एक ही हल है तो निम्न में से क्या अवश्य सही है?

a) $p = 3$

~~b) $p \neq 3$~~

c) $p = 48$

d) $p \neq 48$

$\frac{1}{4} \neq \frac{p}{12} \rightarrow p \neq 3$

coaching center

6. The value of 'a' so that the lines $x + 3y - 8 = 0$ and $ax + 12y - 32 = 0$ are parallel:

a का वह मान बताओ जिसके लिए रेखाएं $x + 3y - 8 = 0$ और $ax + 12y - 32 = 0$ समानांतर हैं।

a) 0

b) 1

c) 4

d) Not possible

$$\frac{1}{a} = \frac{3}{12} \neq \frac{-8}{-32}$$

Handwritten annotations: Blue brackets under the denominators 12 and -32, and blue vertical lines above the numerators 3 and -8.

Not possible

coaching center

$$3 \times \frac{2}{p+q} = \frac{3}{2p-q} = \frac{7}{21}$$

6

$$\left. \begin{array}{l} p+q=6 \\ 2p-q=9 \end{array} \right\} \begin{array}{l} 2p+q=? \\ \nearrow \end{array}$$

7. What is the sum of the value of p and q for which the system of equations $2x + 3y = 7$; $(p + q)x + (2p - q)y = 21$ has infinite number of solutions? **Coincident**

p और q के उन मानों का योग ज्ञात कीजिए, जिनके लिए समीकरणों $2x + 3y = 7$; $(p + q)x + (2p - q)y = 21$ के अपरिमित हल हैं?

a) 5

b) 7

~~c) 6~~

d) 4

$$\frac{2}{a-b} = \frac{3}{a+b} = \frac{7}{3a+b-2}$$

$$2a+2b=3a-3b \quad | \quad 9a+3b-6=7a+7b$$

$$5b = a$$

↓
=1

$$5 = a$$

$$2a - 4b - 6 = 0$$

↓
(5b)

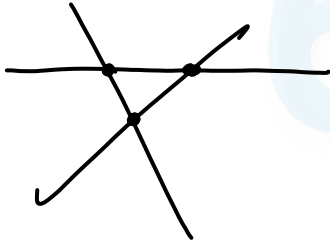
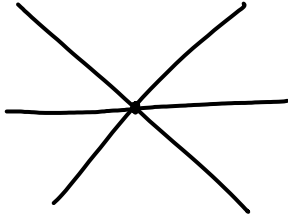
$$6b = 6$$

8. The system of equations: $2x + 3y = 7$ and $(a - b)x + (a + b)y = 3a + b - 2$ have \swarrow infinitely many solutions: **Coincident**

होने पर, समीकरणों के निकाय: $2x + 3y = 7$ और $(a - b)x + (a + b)y = 3a + b - 2$ के अपरिमित रूप से अनेक हल होते हैं।

- ~~a) $a = 5, b = 3$~~ ~~b) $a = 2, b = 3$~~
 c) $a = 2, b = 1$ ~~d) $a = 5, b = 1$~~

coaching center



9. Let there be three simultaneous linear equations in two unknowns, which are non-parallel and non-collinear. What can be the number of solutions ?

Coincidental

2 variable

माना तीन युगपत रेखिक समीकरण हैं, जो गैर-समानांतर और गैर-सम्पाती हैं। हलों की संख्या कितनी होगी ?

- a) One or infinite
- b) only one
- c) One or three
- d) Exactly three

coaching center