

linear equations in two variables

1)

The pair of linear equations is said to be inconsistent if they have

(a) unique solution

(b) no solution

(c) infinite solutions

(d) both (a) and (c)



2)

Find 'k' for infinite solutions: $2x - 3y = 7$, $(k + 2)x - (2k + 1)y = 3(2k - 1)$.

(a) 2

(b) 3

(c) 4

(d) 5

$$\frac{2}{k+2} = \frac{+3}{+(2k+1)}$$

$$4k + 2 = 3k + 6$$

$$k = 4$$

(c)

3)

Which of the following line is parallel to x-axis?

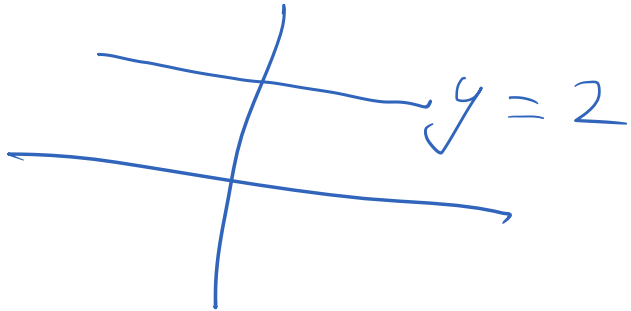
(a) $3x = 5y$

(b) $4x - y = 0$

(c) $3x - 5 = 0$

(d) $5y = 3$

(d)



4)

Lines $x - 2y = 3$ and $3x + ky = 1$ has a unique solution. Value of k is

(a) -6 only

(b) 6 only

(c) all real values except 6

(d) all real values except -6

$$\frac{1}{3} \neq \frac{-2}{k}$$

$$k \neq -6$$

(d)

5)

Equations $2x + 5y = 6$, $4x + 10y = -12$ have

(a) no solution

(b) unique solution

(c) infinite solutions

(d) unique or infinite

6)

If $x + 2y = 2x + y$, then value of $(x + 2y)/(2x + y)$ is

(a) 1

(b) 0

(c) 2

(d) 4

$$x + 2y = 2x + y$$

$$x - 2x = y - 2y$$

$$-x = -y$$

$$x = y$$

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

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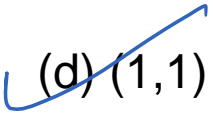
7) Solve for x and y:

$$2x + 3y = 5, 6x - 2y = 4$$

(a) (2,1)

(b) (1, -1)

(c) (3, 2)

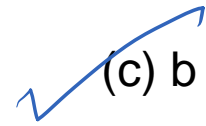
 (d) (1,1)

8)

If $ax + by = a^2 + b^2$ and $bx + ay = 2ab$ then $y =$

(a) a

(b) 1

 (c) b

(d) $-b$

9)

If $31x + 43y = 117$ and $43x + 31y = 105$, then $x + y$ equals

(a) 2

(b) 3

(c) 4

(d) 222

$$\begin{aligned} 74x + 74y &= 222 \\ x + y &= \frac{222}{74} = 3 \end{aligned}$$

10)

A lending library has a fixed charge for first five days (say x) and an additional charge for each day thereafter (say y per day). Charges for keeping a book for 10 days is Rs.31.

Represent the given data algebraically.

(a) $x+10y=31$

(b) $x+7y=31$

(c) $x+5y=31$

(d) none of these

$$x + 5y = 31$$

11)

Solve for x and y:

$$2x + 3y = 7, 4x + 6y = 14$$

infinite solⁿ

~~$0 = 0$
not possible.~~

12)

Find two numbers whose sum is 20 and difference is 4.

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$$x + y = 20$$

$$x - y = 4$$

$$2x = 24$$

$$x = 12$$

$$y = 8$$

12, 8

13) Find m if :

$$2x + 3y = 11, 2x - 4y + 24 = 0, \underline{mx + y = 3}$$

$$2x + 3y = 11$$

$$2x - 4y = -24$$

$$7y = 35$$

$$y = 5$$

$$x = -2$$

$$mx + y = 3$$

$$m(-2) + 5 = 3$$

$$m = 1$$

14)

5 years ago Jacob was 3 times of his friend Amrit. 10 years later age of Jacob will be twice of Amrit. Find present age of Jacob.

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

$$x = 3y - 10$$

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

$$3y - 10 + 10 = 2y + 20$$

$$y = 20$$

$$x = 3(20) - 10 = \underline{50 \text{ years}}$$

15)

Find k if the following pair of linear equations has infinite number of solutions:

$$kx + 3y - (k - 3) = 0; 12x + ky - k = 0$$

$$\frac{k}{12} = \frac{3}{k} = \frac{-(k-3)}{+k}$$

$$k^2 = 36 \quad ; \quad 3k = k^2 - 3k$$

$$k = \pm 6$$

$$6k - k^2 = 0$$

$$k(6 - k) = 0$$

$$k = \underline{0}, k = \underline{6}$$

$$k = 6$$

16)

Find the value of a and b if the following pair of equations have infinite number of solutions:

$$2x + 3y = 7$$

$$(a - b)x + (a + b)y = 3a + b - 2$$

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$$a = 5, b = 1$$

17)

Solve for x and y:

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

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

$$x = 3, y = 2$$

18)

1 man can complete a work in x days and 1 woman can complete the same work in y days. 2 men and 3 women can do a work in 5 days.

Represent this data algebraically.

$$\frac{2}{x} + \frac{3}{y} = \frac{1}{5} \quad \left. \vphantom{\frac{2}{x} + \frac{3}{y} = \frac{1}{5}} \right\}$$

~~$$2x + 3y = 5$$~~

~~$$\frac{2}{x} + \frac{3}{y} = 5$$~~

19)

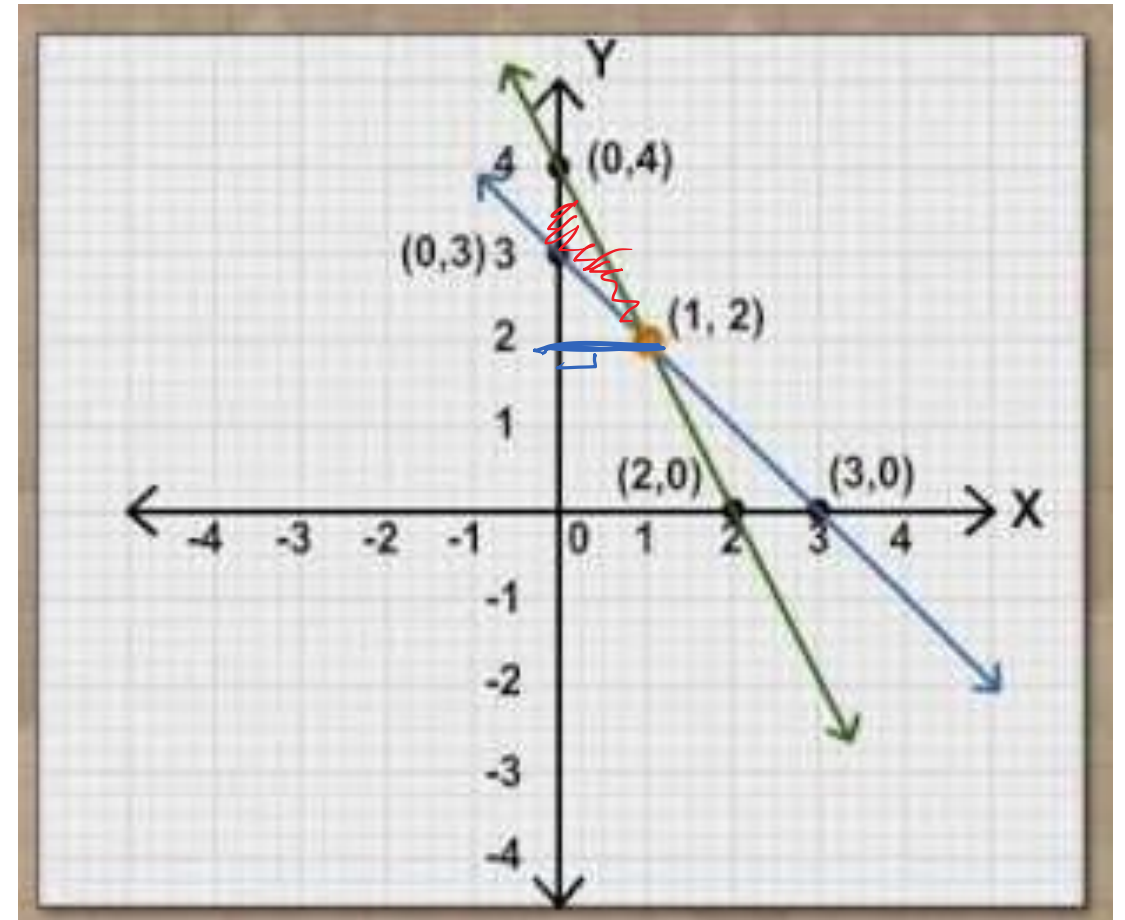
A boat goes 16 km upstream and 24 km downstream in 6 hours. If speed of boat and water be x and y kmph respectively, then represent the following data in linear equations in two variables.

$$\frac{16}{x-y} + \frac{24}{x+y} = 6$$

20)

Find the area of region between the two given lines and y-axis

$$\begin{aligned} \text{Area} &= \frac{1}{2} \times 1 \times 1 \\ &= \frac{1}{2} \\ &= \underline{0.5 \text{ sq. units}} \end{aligned}$$



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