

# VAISHALI EDUCATION POINT

QUALITY EDUCATION PROVIDER

BY RAHUL MISHRA

M:9999907099,9818932244

Class :- X

Subject :- Maths

CHAPTER:LINEAR EQUATIONS IN TWO VARIABLE

QNo.

Questions

- Find the condition for which the following system of equation represents a pair of parallel lines.  
 $ax + by = c$   
 $cx + dy = a$   
 $ad = bc$
- Find the value of a and b for which the following system of equation become coincident lines:  $3x + 4y = 12$ ,  $(a + b)x + 2(a - b)y = 5a - 1$   
 $a = 5$ ,  $b = 1$
- Find the value of k for which system of equation will be consistent.  
 $4x - 5y = k$   
 $2x - 3y = 12$   
For every value of k the system is consistent.
- Express y in terms of x in the equation  $2x + 3y = 11$ . Find the point where the line represented by the equation  $2x + 3y = 11$  cuts  $y = 0$   
 $y = \frac{11-2x}{3}$ ,  $2x + 3y = 11$ , cuts  $y = 0$  at  $\left(\frac{11}{2}, 0\right)$
- Solve graphically  $x = 4$  and  $\frac{3}{2}x - y = 5$
- Solve for x and y.  $\sqrt{3}x + \sqrt{2}y = 0$ ,  $\sqrt{2}x + \sqrt{3}y = 0$   
 $x = 0$ ,  $y = 0$
- Find the value of k for which the following system of equations has non-zero solution  
 $3x - 4y = 0$ ,  $2x + ky = 0$   
 $k = -\frac{8}{3}$
- If  $3x + 7y = 14$ , express x in terms of y. Check whether (3, -2) is a point on the given line or not. (without drawing the graph)  
 $x = \frac{14-7y}{3}$ , No (3, -2) is not on a line.
- 37 chocolates and 53 toffees together cost Rs. 320 while 53 chocolates and 37 toffees together cost Rs. 400. Find the cost of a chocolate and that of a toffee.  
Cost of chocolates = Rs. 6.50 cost of a toffee = Rs. 1.50
- Solve the following system of equation by the method of cross-multiplication:  
 $x\left(a+b-\frac{ab}{a+b}\right) = y\left(a-b+\frac{ab}{a-b}\right)$ ,  $x + y = 1$

$$x = \frac{a^3 + b^3}{2a^3}, y = \frac{a^3 - b^3}{2a^3}$$

11

Solve for x and y :  $bx + ay = a + b$ ,  $ax\left(\frac{1}{a-b} - \frac{1}{a+b}\right) + ay\left(\frac{1}{b-a} - \frac{1}{b+a}\right) = \frac{2a}{a+b}$

$$x = \frac{a}{b}, y = \frac{b}{a}$$

12

Solve for x and y  $\frac{1}{2(2x+3y)} + \frac{1}{7(3x-2y)} = \frac{17}{70}$ ,  $\frac{7}{2x+3y} - \frac{7}{3x-2y} = \frac{28}{5}$  where  $2x + 3y \neq 0$  and  $3x - 2y \neq 0$ .



13

Find the value of k for which the following system has (i) unique solution (ii) no solution

$$x + 2y - 3 = 0$$

$$5x + ky = -7$$

(i)  $k \neq 10$ ; (ii)  $k = 10$

14

Find graphically the vertices of the  $\Delta$  whose sides have the equations  $2y - x = 8$ ,  $5y - x = 14$  and  $y = 2x + 1$ . Also find the area of triangle.

15

Solve graphically the following system of linear equations  $x + y = 3$ ,  $3x - 2y = 4$ . Find the co-ordinates and area of  $\Delta$  formed by these equations and  $y = 0$ .

16

Solve graphically  $2x + 7y = 11$  and  $5x + \frac{35}{2}y = 25$ . Also find the point where these lines meet x-axis.

17

The age of a father is equal to the sum of the ages of his 5 children after 15 years sum of the ages of the children will be twice the age of father. Find the age of the father.  
45 years

18

In an examination paper, one mark is awarded for every correct answer while  $\frac{1}{4}$  mark is deducted for every wrong answer. Kunal answered 120 questions and got 90 marks. How many questions did he answer correctly.

96

19

If you travel by an autorickshaw the fare for the first Km is different from the rate per Km for the remaining distance. The total fare for a distance of 20km is Rs 41.50 and that for a distance of 26Km it is Rs. 53.50. Find the auto fare for a distance of 35 km.  
Rs. 71.50

20

Surbhi travels 600km partly by train and partly by car. If she covers 400Km by train and the rest by car it takes her 6 hours and 30 minutes. But if she travels 200Km by train and the rest by car, she takes an hour longer. Find the speed of the train and that of the car.

Speed of train 100km/hr. Speed of car 80km/hr.

21

A cyclist after riding a certain distance stopped for half an hour to repair his machine after which he completes the whole journey of 30Km at half speed in 5 hours. If the breakdown has occurred 10Km further off, he would have done the whole journey in 4

hrs. Find where the break down occurred and his original speed. (Speed = 10Km/h. breakdown after 15Km)

Speed = 10km/hr, breakdown after 15km.

- 22 Ratio between the girls and boys in a class of 40 students is 2 : 3. Five new students joined the class. How many of them must be boys so that the ratio between girls & boys becomes 4 : 5?

1 boy.

- 23 If two liquids are mixed in the ratio 3 : 2, a mixture is obtained weighting 1.04g per cc, while if they are mixed in the ratio 5 : 3 the resulting mixture weighs 1.05 g per cc. Find the weight of a cc of each of the original liquids.

Weight of I type liquid per cc is 1.2 gm [Hint:  $3x + 2y = 5 \times 1.04$ ]  
Weight of II type liquid per cc is 8 gm [  $5x + 3y = 8 \times 1.5$  ]

- 24 The charges of a 5 day trip by a tourism bus for one full and a half ticket are Rs. 1440 inclusive of boarding charges, which are same for a full as well as for a half ticket. The charges for the same trip for 2 full and one half ticket inclusive of boarding charges are Rs. 2220. The fare for a half ticket is 75% of the full fare ticket. Find the fare and the boarding charges separately for one full ticket.

Full fare = Rs. 480, boarding charges = Rs. 300

- 25 A dealer sold a refrigerator and an A.C. for Rs.25,820 making a profit of 15% on refrigerator and 10% on A.C. By selling them for Rs. 25, 930, he would have realised a profit of 10% on refrigerator and 15% on A.C. Find the cost price of each.

Cost price of refrigeration is Rs. 10400, cost price of A.C. = Rs. 12600

- 26 The population of a town at present is 50,000. If in a year the number of males were to increase 5% and female by 3% the population would grow to be 52, 020 in a year. Find the number of males and females in the town at present.

Males = 26000, Females = 24000

- 27 A swimming pool is filled with three pipes with uniform flow. The first two pipes operating Simultaneously fill the pool in the same time during which the third pipe fills. The second pipe fill the pool 5 hrs faster than the first pipe and 4hrs. Slower than the third pipe. Find the time required by each pipe to fill the pool individually.

I pipe = 15hrs, II pipe = 10hrs, III pipe = 6hrs.

- 28 In covering a distance of 30 Km. Ajit takes 2 hrs more than Amit. If Ajit doubles his speed he would take 1 hr. Less than Amit. Find their rates of walking.

Ajit = 5km/hr. Amit = 7.5km/hr.

- 29 A hemispherical depression is cut from one face of a cubical wooden block such that the diameter 'l' of the hemisphere is equal to the edge of the cube. Determine the surface area of the remaining solid.

OR

A copper rod of diameter 1 cm and length 8 cm is drawn into a wire of length 18 m of uniform thickness. Find the thickness of the wire. (2010)

- 30 Draw the graph of  $2y = 4x - 6$   $2x = y + 3$  and determine whether this system of linear equations has a unique solution or not.

- 31 Check graphically whether the pair of equations  $3x - 2y + 2 = 0$  and  $x - y + 3 = 0$ , is

consistent. Also find the coordinates of the points where the graphs of the equations meet the Y-axis.

- 32 Solve the following system of linear equations graphically.  $5x - 6y + 30 = 0$ ,  $5x + 4y - 20 = 0$  Does the point  $(3, 2)$  lie on any of the lines? Write its equation.
- 33 Solve the following system of linear equations graphically.  $5x - 6y + 30 = 0$ ,  $5x + 4y - 20 = 0$  Also find the vertices of the triangle formed by the above two lines and X-axis.
- 34 Represent the following pair of equations graphically and write the coordinates of points when the lines intersect Y-axis.  $x + 3y = 6$ ,  $2x - 3y = 12$
- 35 Solve graphically the system of linear equations:  $4x - 3y + 4 = 0$ ,  $4x + 3y - 20 = 0$  Find the area of the region bounded by these lines and X-axis.
- 36 Draw the graph of the following pair of linear equations:  $x + 3y = 6$ ,  $2x - 3y = 12$  Hence, find the area of the region bounded by  $x = 0$ ,  $y = 0$  and  $2x - 3y = 12$
- 37 Determine graphically the co-ordinates of the vertices of the triangle, the equations of whose sides are :  $y = x$  ;  $3y = x$ ,  $x + y = 8$
- 38 Form a pair of linear equations in two variables using the following information and solve graphically: Five years ago, Sagar was twice as old as Tiru. Ten years later Sagar's age will be ten years more than Tiru's age. Find their present ages. What was the age of Sagar when Tiru was born?
- 39 Solve the following system of linear equations graphically:  $3x + y - 12 = 0$ ,  $x - 3y + 6 = 0$  Shade the region bounded by these lines and the X-axis. Also find the ratio of areas of triangle formed by the given lines with X-axis and the Y-axis.
- 40 Find the value of a so that the point  $(3, a)$  lies on the line represented by  $2x - 3y = 5$ .
- 41 Express y in terms of x for the given line  $-2x - 3y = 7$ . Check whether  $(2, -1)$  is a point on the given line.
- 42 Find the point where the line represented by the equation  $2x + 3y = 11$  cuts Y-axis.
- 43 Without drawing the graphs, state whether the following pair of linear equations will represent intersecting lines, coincident lines or parallel lines:  $6x - 3y + 10 = 0$ ,  $2x - y + 9 = 0$  Justify your answer.
- 44 Find the value of k for which the system of equations have a unique solution.  $x - ky = 2$ ,  $3x + 2y = -5$

- 45 Find the value of  $k$  for which the system of equations has no solution.  $3x - y - 5 = 0$ ,  $6x - 2y - k = 0$
- 46 Determine the value of  $c$  for which the following system of linear equations has no solution  $2cx + 3y = 3$ ,  $12x + cy = 6$
- 47 For what value of  $k$ , the following system of equations have (i) a unique solution, (ii) no solution.  $2x + ky = 1$ ,  $3x - 5y = 7$
- 48 For what value of  $k$ , the following system of equations have (i) a unique solution, (ii) no solution  $24x - y = 11$ ,  $kx + 3y = 5$ .
- 49 For what value of  $k$ , the following pair of linear equations has infinitely many solutions  $2kx + 5y - (k - 5) = 0$ ,  $20x + ky - k = 0$
- 50 Solve the system of equations using cross multiplication method:  $2x + 5y = 1$ ,  $2x + 3y = 3$
- 51 Solve for  $x$  and  $y$  :  $4x + \frac{y}{3} = \frac{8}{3}$ ,  $\frac{x}{2} + \frac{3y}{4} = -\frac{5}{2}$
- 52 Solve for  $x$  and  $y$  :  $\frac{x+1}{2} + \frac{y-1}{3} = 8$ ,  $\frac{x-1}{3} + \frac{y+1}{2} = 9$
- 53 Solve for  $x$  and  $y$  :  $8x - 9y = 6xy$ ,  $10x + 6y = 19xy$ .
- 54 Solve for  $x$  and  $y$ :  
 $\frac{4}{x} + 5y = 7$   
 $\frac{3}{x} + 4y = 5$
- 55 Find the solution of the pair of the equations:  
 $\frac{3}{x} + \frac{8}{y} = -1$   
 $\frac{1}{x} - \frac{2}{y} = 2$   
 $x, y \neq 0$
- 56 Solve for  $x$  and  $y$ :  
 $\frac{2}{x} + \frac{2}{3y} = \frac{1}{6}$   
 $\frac{3}{x} + \frac{2}{y} = 0$  and hence find 'a' for which  $y = ax - 4$ .

57

Find the value of x:

$$\frac{9}{x+1} - \frac{8}{y-1} = 1$$

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

$$(x \neq -1, y \neq 1)$$

58

Solve the following pair of equations for x and y:

$$\frac{15}{x-y} + \frac{22}{x+y} = 5$$

$$\frac{40}{x-y} + \frac{35}{x+y} = 13$$

$$x \neq y$$

$$x \neq -y$$

59

Solve for y :

$$ax + by = 2ab$$

$$bx + ay = a^2 + b^2.$$

60

Solve for x and y :

$$ax + by = a - b$$

$$bx - ay = a + b.$$

61

Solve the following equations for x and y:

$$mx - ny = m^2 = n^2, x + y = 2m.$$

62

Solve the following system of linear equations;

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

63

Solve for x and y :

$$\frac{2a}{x} + \frac{3b}{y} + 1 = 0$$

$$\frac{3a}{x} - \frac{b}{y} - 4 = 0$$

64

Solve the following equations for x and y:

$$\frac{a^2}{x} - \frac{b^2}{y} = 0$$

$$\frac{a^2b}{x} + \frac{b^2a}{y} = a+b$$

$$(x, y) \neq (0)$$

65

Solve for x and y:  $\frac{b}{a} - \frac{a}{b} = a^2 + b^2$   $x + y = 2ab.$ 

66

Solve for x and y :  $\frac{ax}{b} - \frac{by}{a} = a+b$   $ax - by = 2ab.$

- |    |  |
|----|--|
| 67 | 5 books and 7 pens together cost Rs. 79 whereas 7 books and 5 pens together cost Rs. 77. Find the total cost of 1 book and 2 pens.   |
| 68 | (a) The monthly incomes of A and B are in the ratio of 4 : 3 and their monthly expenditures are in the ratio of 13 : 9. If each saves Rs. 1,500 per month, find the monthly income of each.<br>(b) The monthly incomes of A and B are in the ratio of 5 : 4 and their monthly expenditures are in the ratio of 7 : 5. If each saves Rs. 3,000 per month, find the monthly incomes of each. |
| 69 | The sum of the numerator and the denominator of a fraction is 12. If the denominator is increased by 3, the fraction becomes $\frac{1}{2}$ . Find the fraction.  |