

MATHS

BOOKS - VK GLOBAL PUBLICATION MATHS (HINGLISH)

PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

Very Short Answer Questons

1. If the lines given by 3x + 2ky = 2 and 2x + 5y + 1 = 0 are parallel,

then the value of k is



2. The value of c for which the pair of equations cx-y=2 and

6x-2y=3 will have infinitely many solutions is



Short Answer Questions I

1. Is the following of linear equations consistent ? Justify your answer.

 $2ax+by=a,4ax+2by-2a=0,a,b,\
eq 0$

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2. For all real values of c , the pair of equations x - 2y = 8 and 5x - 10y = c have a unique solution. Justify whether it is true of false .

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3. Do the following equations represent a pair of coincident lines ? Justify your answer.

(i) $3x + \frac{1}{7}y = 3$ and 7x + 3y = 7(ii) -2x - 3y = 1 and 6y + 4x = -2(iii) $\frac{x}{2} + y + \frac{2}{5} = 0$ and $4x + 8y + \frac{5}{16} = 0$

4. If x = a and y = b is the solution of the equations x - y = 2 and x + y = 4,

then the values of a and b are, respectively



5. On comparing the ratios $\frac{a_1}{a_2}$, $\frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, find out whether the following pair of linear equations are consistent, or inconsistent. (i) $(ii)(iii)3x + 2y = 5; \ 2x3y = 7(iv)$ (v) (vi) '(vii) (viii)2x 3y

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6. On comparing the ratios $\frac{a_1}{a_2}$, $\frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, find out whether the following pair of linear equations are consistent, or inconsistent. (i) $(ii)(iii)3x + 2y = 5; \ 2x3y = 7(iv)$ (v) (vi) '(vii) (viii)2x 3y

7. On comparing the ratios $\frac{a_1}{a_2}$, $\frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, and without drawing them, find out whether the lines representing the following pairs of linear equations intersect at a point, are parallel or coincide: 5x - 4y + 8 = 0; 7x + 6y - 9 = 0 (ii) 9x + 3y + 12 = 0; 18x + 6y + 24 = 0 (iii) 6x - 3y + 10 = 0; 2x - y + 9 = 0

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8. On comparing the ratios $\frac{a_1}{a_2}$, $\frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, and without drawing them, find out whether the lines representing the following pairs of linear equations intersect at a point, are parallel or coincide: 5x - 4y + 8 = 0; 7x + 6y - 9 = 0 (ii) 9x + 3y + 12 = 0; 18x + 6y + 24 = 0 (iii) 6x - 3y + 10 = 0; 2x - y + 9 = 0

9. On comparing the ratios $\frac{a_1}{a_2}$, $\frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, and without drawing them, find out whether the lines representing the following pairs of linear equations intersect at a point, are parallel or coincide: 5x - 4y + 8 = 0; 7x + 6y - 9 = 0 (ii) 9x + 3y + 12 = 0; 18x + 6y + 24 = 0 (iii) 6x - 3y + 10 = 0; 2x - y + 9 = 0

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Short Answer Questions li

1. "Solve for x and y; ax + by = a - b, bx - ay = a + b





3.
$$\frac{bx}{a} + \frac{ay}{b} = a^2 + b^2$$
,

x + y = 2ab

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4. Find the values of a and b for which the following system of equations has infinitely many solutions: 2x + 3y = 7, (a - b)x + (a + b)y = 3a + b - 2

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5. For what value of k will the following system of linear equations has

no solution? 3x + y = 1, (2k - 1)x + (k - 1)y = 2k + 1

6. Find whether the following pair of linear equations has a unique solution. If yes, find the solution.

7x - 4y = 49 and 5x - 6y = 57



8. Solve the following system of equations by method of crossmultiplication: $\frac{a^2}{x} - \frac{b^2}{y} = 0$, $\frac{a^2b}{x} + \frac{b^2a}{y} = a + b$, $x, y \neq 0$ Watch Video Solution 9. In a $ABC, \ \ igstarrow A = xo, \ \ igstarrow B = 3xo$ and igstarrow C = yo . If 3y-5x=30 ,

prove that the triangle is right angled.



10. ABCDE is a pentagon with BE||CD and BC||DE, BC is perpendicular to CD If the perimeter of ABCDE is 21 cm, find x and y.





11. Five years ago, A was thrice as old as B and 10 years later, A shall be

twice as old as B. What are the present ages of A and B?

12. A fraction becomes $\frac{1}{3}$ when 1 is subtracted from the numerator and it becomes $\frac{1}{4}$ when 8 is added to its denominator. Find the fraction.

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13. Slve the following pairs of equations by reducting them to a pair of

linear equations:

(i)
$$\frac{7x - 2y}{xy} = 5$$

 $\frac{8x + 7y}{xy} = 15$
(ii) $\frac{1}{3x + y} + \frac{1}{3x - y} = \frac{3}{4}$
 $\frac{1}{2(3x + y)} - \frac{1}{2(3x - y)} = \frac{-1}{8}$

1. Form the pair of linear equations in the following problem, and find the solution graphically: 10 students of class X took part in Mathematics quiz. If the number of girls is 4 more than the number of boys, find the number of boys and girls who took part in the quiz.

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2. Show graphically that the system of equations

2x + 4y = 10 and 3x + 6y = 12 has no solution.



3. Solve the following pair of linear equations by the elimination method and the substitution method:(i) x + y = 5 and 2x - 3y = 4(ii)

$$2x + 4y = 10$$
 and $2x - 2y = 2$ (iii) $3x - 5y - 4 = 0$ and $9x = 2y + 7$
(iv) $\frac{x}{2} + \frac{2y}{3} = -1$ and $x - \frac{y}{3} = 3$

4. Draw the graphs of x - y + 1 = 0 and 3x + 2y - 12 = 0. Determine the coordinates of the vertices of the triangle formed by these lines and x-axis and shade the triangular area. Calculate the area bounded by these lines and x-axis.



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5. A part of monthly hostel charges is fixed and the remaining depends on the number of days one has taken food in the mess. When a student A takes food for 20 days she has to pay 1000 as hostel charges whereas a student who takes B food for 26 days, pays 1180 as hostel charges. Find the fixed charges and the cost of food per day.

6. Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each incorrect answer, then Yash would have scored 50 marks. How many questions were there in the test?



7. Places A and B are 100 km apart on a highway. One car starts from A and another from b at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of the two cars



8. The area of a rectangle gets reduced by 9 square units if its length is reduced by 5 units and breadth is increased by 3 units. If we increase the length by 3 units and the breadth by 2 units, the area increases by 67 squ units. Find the dimensions of the rectangle.

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9. Ritu can row downstream 20 km in 2 hours, and upstream 4 km in 2 hours. Find her speed of rowing in still water and the speed of the current.

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10. The sum of a two digit number and the number formed by interchanging its digits is 110. If 10 is subtracted from the first number, the new number is 4 more than 5 times the sum of the digits in the first number. Find the first number.



Hots Higher Order Thinking Skills

1. 8 men and 12 boys can finish a piece of work in 10 days while 6 men and 8 boys can finish it in 14 days. Find the time taken by one man alone and that by one boy alone to finish the work.

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2. Students of a class are made to stand in row. If one student is extra in each row, there would be 2 rows less. If one student is less in each row, there would be 3 rows more. Find the number of students in the calss.



3. Draw the graphs of 2x + y = 6 and 2x - y + 2 = 0. Shade the region bounded by these lines and x-axis. Find the area of the shaded region.



4. A train covered a certain distance at a uniform speed. If the train would have been 10 km/h faster, it would have taken 2 hours less than the scheduled tune. And. if the train were slower by 10 km/h; it would have taken 3 hours more than the s

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Proficiency Exercise Very Short Answer Questions

1. For the pair of equations $\lambda x + 3y + 7 = 0$ and 2x + 6y - 14 = 0. To

have infinitely many solutions, the value of λ should be 1 . Is the





2. Write the number of solutions of the following pair of linear equations:

$$3x - 7y = 1$$
 and $6x - 14y - 3 = 0$

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3. How many solutions does the pair of equations x + 2y - 3 = 0 and $\frac{1}{2}x + y - \frac{3}{2} = 0$ have ?

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4. The value of k for which the system of equations x + 2y - 3 = 0and 5x + ky + 7 = 0 has no solution, is (a) 10 (b) 6 (c) 3 (d) 1 5. Find the value of k for which the system of equations 2x + 3y = 7 and 8x + (k + 4)y - 28 = 0 has infinitely many solution.

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6. Find the value of k for which the system of equations kx - 4y = 3, 7x - 2y = 5 has a unique solution.

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Proficiency Exercise Short Answer Questions I

1. Is the pair of equations x - y = 5 and 2y - x = 10 inconsistent ?

Justify your answer.



2. Do the equations 5x + 7y = 8 and 10x + 14y = 4 represent a pair

of coincident lines ? Justify your answer.

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3. Is the pair of equations 3x - 5y = 6 and 4x - 6y = 7 consistent ?

Justify your answer.

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4. It is true to say that the pair of equations -2x + y + 3 = 0 and $\frac{1}{3}x + 2y - 1 = 0$ has a unique solution ? Justify your answer.

5. Find the value of k for which the lines
$$(k + 1)x + 3ky + 15 = 0$$
 and $5x + ky + 5 = 0$ are coincident.
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6. If the system of equations $4x + y = 3$ and $(2k - 1)x + (k - 1)y = 2k + 1$ is inconsistent, then find k.
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7. If the system of equations $2x + 3y = 7$, $(a + b)x + (2a - b)y = 21$ has infinitely many solutions, then $a = 1$, $b = 5$ (b) $a = 5$, $b = 1$ (c) $a = -1$, $b = 5$ (d) $a = 5$, $b = -1$

8. On comparing the ratios $\frac{a_1}{a_2}$, $\frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, find out whether the following pairs of linear equations are consistent of inconsistent. 4x - 5y = 8 and $3x - \frac{15}{4}y = 6$ Watch Video Solution

9. On comparing the ratios $\frac{a_1}{a_2}$, $\frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, find out whether the following pairs of linear equations are consistent or inconsistent. x - 5y = 7 and -3x + 15y = 8

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10. For which value (s) of k will the pair of equations

kx + 3y = k - 3,

12x + ky = k

has no solution ?

11. A pair of linear equations which has a unique solution x = 2 and y = -3

is



12. If x = a and y = b is the solution of the pair of equation

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x - y = 5 and x + y = 3, find 'a' and 'b'.

13. Find relation between p and q if x = 3, y = 1 is a solution of a pair

of lines x - 4y + p = 0 and 2x + y - q - 2 = 0.

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14. Find the value of k for which the system of equations x + 3y - 4 = 0 and 2x + ky = 7 is inconsistent.



Proficiency Exercise Short Answer Questions Ii

1. Find the solution of the pair of equations $\frac{x}{10} + \frac{y}{5} - 1 = 0$ and $\frac{x}{8} + \frac{y}{6} = 15$ and find λ , if $y = \lambda x + 5$. Watch Video Solution

2. Find the values of a and b for which the following pair of equations have infinitely many solutions:

(i)
$$2x + 3y = 7$$
 and $2ax + ay = 28 - by$
(ii) $2x + 3y = 7$, $(a - b)x + (a + b)y = 3a + b - 2$
(iii) $2x - (2a + 5)y = 5$, $(2b + 1)x - 9y = 15$

3. Given the linear equation 3x - 2y + 7 = 0, write another linear equation in two variables such that the geometrical representation of the pair so formed is (i)intersecting lines

(ii) parallel lines

(iii) coincident lines

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4. If the angles of a triangle are x, y and $40^{\,\circ}$ and the difference

between the two angles x and y is 30° . Then, find the value of x and y.



5. Draw the graph of the pair of equations x - 2y = 4 and 3x + 5y = 1. Write the vertices of the triangle formed by these lines and the y-axis. Also find the area of this triangle. Watch Video Solution

6. If (x+1) is a factor of $2x^3 + ax^2 + 2bx + 1$, then find the value of a

and b given that 2a-3b=4.

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7. The angles of a cylic quadrilateral ABCD are $\angle A = (2x+4)^\circ, \angle B = (y+3)^\circ, \angle C = (2y+10)^\circ, \angle D = (4x-5)^\circ.$

Find x and y and hence the values of the four angles.

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8. A two-digit number is 3 more than 4 times the sum of its digits. If 18

is added to the number, the digits are reversed. Find the number.

9. Solve the following system of equations by method of crossmultiplication: $\frac{57}{x+y} + \frac{6}{x-y} = 5$, $\frac{38}{x+y} + \frac{21}{x-y} = 9$ Watch Video Solution

10. Find whether for following pairs of equations are consistent or not

by graphical method. If consistent, solve them.

$$(i)x - 2y = 6$$

3x - 6y = 0

(ii)
$$4x + 7y = -11$$

5x - y + 4 = 0

11. The age of the father is twice the sum of the ages of his two children. After 20 yr, his age will be equal to the sum of the ages of his children. Find the age of the father.

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12. There are some students in the two examination halls A and B. To make the number of students equal in each hall, 10 students are sent from A to B but, if 20 students are sent from B to A, the number of students in A becomes double the number of students in B, then find the number of students in the both halls.

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13. Solve the following system of equation:

 $\sqrt{2x}$ – $\sqrt{3y}=0$;

$$\sqrt{3x}-\sqrt{8y}=\sqrt{2}$$

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14. The larger of two supplementary angles exceeds thrice the smaller by 20 degrees. Find them.

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15. Solve graphically each of the following systems of linear equations. Also, find the coordinates of the points where the lines meet the axis of

y.

x+2y-7=0

2x - y - 4 = 0

16. Solve graphically each of the following systems of inear equations. Also, find the coordinates of the points where the lines meet the axis of

х.

x + 2y = 5

2x-3y=-4

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17. IF 3x + 5Y = 9 and 5x + 3y = 7 then find the value of x + y



18. Half the perimeter of a rectangular garden, whose length is 4 m

more than its width, is 36 m. Find the dimensions of the garden.

19. Two numbers are in the ratio of 1:3. If 5 is added to both the numbers, the ratio becomes 1:2 Find the numbers.

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20. A's age is seven times B's age. Four years hence, the age of A will be six times B's age. Find the present ages (in years), of person A and

B.

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Proficiency Exercise Long Answer Questions

1. Find the values of α and β for which the following system of linear equations has infinite number of solutions: 2x + 3y = 7, $2\alpha x + (\alpha + \beta)y = 28$

2. Draw the graphs of the equations y = -1, y = 3 and y = 4x - 5. Also, find the area of the quadrilateral formed by the lines and the y-axis.

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3. Solve the following system of linear equation graphically and shade							
the	region	between	the	two	lines	and	x-axis.
$3x+2y-4=0, \ \ 2x-3y-7=0$							
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4. Determine graphically, the vertices of the triangle formed by the lines

y=x, 3y=x and x+y=8



5. The cost of 4 pens and 4 pencils boxes is Rs. 100. Three times the cost of a pen is Rs. 15 more than the cost of a pencil box. Form the pair of linear equations for the above situation. Find the cost of a pen and a pencil box.

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6. Ankita travels 14km to her home partly by rickshaw and partly by bus. She takes half an hour if she travels 2 km by rickshaw, and the remaining distance by bus. On the other hand, if she travel 4 km by rickshaw and the remaining distance by bus, she takes 9 minute longer. Find the speed of the rickshaw and of the bus.

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7. The sum of a two digit number and the number obtained by reversing the order of its digits is 165. If the digits differ by 3, find the

number.	
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8. Two years ago, a father was five times as old as his son. Two years later, his age will be 8 more than three times the age of the son. Find the present ages of father and son.



9. The sum of the numerator and denominator of a fraction is 3 less than twice the denominator. If the numerator and denominator are decreased by 1, the numerator becomes half the denominator. Determine the fraction.



10. A two-digit number is 4 times the sum of its digits and twice the product of the digits. Find the number.



11. Susan invested certain amount of money in two schemes A and B, which offer interest at the rate of 8% per annum and 9% per annum, respectively. She received Rs. 1860 as annual interest. However, had she interchanged the amount of investments in the two schemes, she would have received Rs. 20 more as annual interest. How much money did she invest in each scheme ?

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12. A part of monthly hostel charges in a colege are fixed and the remaining depend on the number of days one has taken food in the mess. When a student A takes food for 15 days, he has to pay Rs 1200 as

hostel charges whereas a student B, who takes food for 24 days, pays Rs 1560 as hostel charges. Find the fixed charges and the cost of food per day.



13. Points A and B are 70 km. apart on a highway. A car starts from A and another car starts from B simultaneously. If they travel in the same direction, they meet in 7 hours, but if they travel towards each other, they meet in one hour. Find the speed of the two cars.



14. A man travels 600 km partly by train and partly by car. If he covers 400 km by train and the rest by car, it takes him 6 hours and 30 minutes. But, if he travels 200 km by train and the rest by car, he takes half an hour longer. Find the speed of the train and that of the car.

15. 2 women and 5 men can together finish an embroidery work in 4 days, while 3 women and 6 men can finish it in 3 days. Find the time taken by 1 woman alone to finish the work, and also that taken by 1 man alone.



16. Yash scored 35 marks in a test, getting 2 marks for each right answer and losing 1 mark for each wrong answer. Had 3 marks been awarded for each correct answer and 2 marks been deduced for each incorrect answer, then Yash would have scored 50 marks. How many question were there in the test ?

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17. The students of a class are made to stand in rows. If 3 students are extra in a row, there would be 1 row less. If 3 students are less in a row there would be 2 rows more. Find the number of students in the class.



18. The car hire charges in a city comprise of a fixed charges together with the charge for the distance covered. For a journey of 12 km, the charge paid is Rs 89 and for a journey of 20 km, the charge paid is Rs 145. What will a person have to pay for travelling a distance of 30 km?

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19. A person can row a boat at the rate of 5 km/hour in still water. He takes thrice as much time in going 40 km upstream as in going 40 km downstream. Find the speed of the stream.

20. Solve graphically the system of linear equations 4x - 3y + 4 = 0, 4x + 3y = 20 also find the area of the region bounded by the lines and x-axis.



2. The pair of equations x = a and y = b graphically represents lines

which are

3. Write the pair of linear equatins which has the unique solution x = 1, y = -1.



$$x+2y=3 \,\, {
m and} \,\, {1\over 2}x+y-{3\over 2}=0$$
 have ?

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5. If x = a, y = b is the solution of the equations

 $x-y=2 \ {
m and} \ x+y=4, \ {
m then}$ find the values of a abd b.

6. in the triangle $ABC, \angle A = x^{\circ}, \angle B = 3x^{\circ}, \angle C = y^{\circ}$. if 3y - 5x = 30 then prove that the triangle is right angled.

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7. If
$$3x + 7y = -1$$
 and $4y - 5x + 14 = 0$, find the values of $3x - 8y$ and $\frac{y}{x} - 2$.

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8. Solve the following system of equations by method of crossmultiplication: $mx - ny = m^2 + n^2$, x + y = 2m

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9. Half the perimeter of a rectangular garden, whose length is 4 m more

than its width, is 36 m. Find the dimensions of the garden.

10. Solve graphically the system of linear equations: 4x - 3y + 4 = 0, 4x + 3y - 20 = 0 Find the area bounded by these lines and x-axis.

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11. A person can row a boat at the rate of 5 km/hour in still water. He takes thrice as much time in going 40 km upstream as in going 40 km downstream. Find the speed of the stream.