MATHS

BOOKS - NCERT EXEMPLAR MATHS (HINGLISH)

PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

Pair Of Linear Equations In Two Variables

1. Graphically, the pair of equations

$6x - 3y + 10 = 0$

$2x - y + 9 = 0$

represents two lines which are

A. intersecting at exactly one point

B. intersecting exactly two points

C. coincident

D. parallel

Answer: D

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2. The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ has

A. a unique solution

B. exactly two solutions

C. infinitely many solutions

D. no solution

Answer: D

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3. If a pair of linear equations in two variables is consistent, then the lines represented by two equations are

A. parallel

B. always coincident

C. intersecting or coincident

D. always intersecting

Answer: C

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4. The pair of equations $y = 0$ and $y = -7$ has

A. one solution

B. two solutions

C. infinitely many solutions

D. no solution

Answer: D

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5. The pair of equations $x = a$ and $y = b$ graphically represents lines which are

A. parallel

B. intersecting at (b, a)

C. coincident

D. intersecting at (a, b)

Answer: D

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6. For what value of k, do the equations $3x - y + 8 = 0$ and $6x - ky = -16$ represent coincident lines ?

A. $\frac{1}{2}$

B. $-\frac{1}{2}$

C. 2

D. -2

Answer: C

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7. If the lines given by $3x + 2ky = 2$ and $2x + 5y = 1$ are parallel, then the value of k is

A. $-\frac{5}{4}$

B. $\frac{2}{5}$

C. $\frac{15}{4}$

D. $\frac{3}{2}$

Answer: C

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8. The value of c for which the pair of equations $cx - y = 2$ and $6x - 2y = 3$ will have infinitely many solutions is

A. 2

B. -3

C. -12

D. no value

Answer: D

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9. One equation of a pair of dependent linear equations is $-5x + 7y - 2 = 0$. The second equation can be

A. $10x + 14y + 4 = 0$

B. $-10x - 14y + 4 = 0$

C. $-10 + 14y + 4 = 0$

D. $10x - 14y + 4 = 0$

Answer: D

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

A. $x + y = 1 \text{ and } 2x - 3y = -5$

B. $2x + 5y = -11 \text{ and } 4x + 10y = -22$

C. $2x - y = 1 \text{ and } 3x + 2y = 0$

D. $x - 4y - 14 = 0 \text{ and } 5x - y - 13 = 0$

Answer: B

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11. 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

A. 3 and 5

B. 5 and 3

C. 3 and 1

D. -1 and -3

Answer: C

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12. Aruna has only Rs. 1 and Rs. 2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is Rs. 75, then the number of Rs. 1 and Rs. 2 coins are, respectively

A. 35 and 15

B. 35 and 20

C. 15 and 35

D. 25 and 25

Answer: D

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13. The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages (in year) of the son and the father are, respectively

A. 4 and 24

B. 5 and 30

C. 6 and 36

D. 3 and 24

Answer: C

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14. Do the following pair of linear equations have no solution ? Justify your answer.

(i) 2x + 4y = 3 and 12y +6x = 6

(ii) x = 2y and y = 2x

(iii) 3x + y - 3 = 0 and $2x + \frac{2}{3}y = 2$

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15. 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 $4x + 8y + \frac{5}{16} = 0$

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16. Are the following pair of linear equations consistent ? Justify your answer.

(i) $-3x - 4y = 12$ and $4y + 3x = 12$

(ii) $\frac{3}{5}x - y = \frac{1}{2}$ and $\frac{1}{5}x - 3y = \frac{1}{6}$

(iii) $2ax + by = a$ and $4ax + 2by - 2a = 0, a, b \neq 0$

(iv) $x + 3y = 11$ and $2(2x + 6y) = 22$

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17. 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 statement true ?

A. yes

B. no

C. can not say anything

D. none of these

Answer: B

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18. For all real values of c , the pair of equations $x - 2y = 8$ and $5x - 10y = c$ have no solution. Justify whether it is true of false .

A. true

B. false

C. can not say anything

D. none of these

Answer: B

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19. The line represented by x = 7 is parallel to the X-axis, justify whether the statement is true or not.

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20. For which value (s) of λ, do the pair of linear equations $\lambda x + y = \lambda^2$ and $x + \lambda y = 1$ have

(i) no solution ? (ii) infinitely many solutions ?

(iii) a unique solution ?

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

$kx + 3y = k - 3,$

$12x + ky = k$

has no solution ?

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22. For which values of a and b will the following pair of linear equations has infinitely many solutions ?

$x + 2y = 1$

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

A. $a = 3, b = 1$

B. $a = 1, b = 3$

C. $a = 1, b = 1$

D. $a = 3, b = 3$

Answer: A

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23. Find the values of p in (i) to (iv) and p and q in (v) for the following pair of equations

(i) $3x - y - 5 = 0$ and $6x - 2y - p = 0$, if the lines represented by these equations are parallel.

(ii) $-x + py = 1$ and $px - y = 1$, if the pair of equations has no solution.

(iii) $-3x + 5y = 7$ and $2px - 3y = 1$,

if the lines represented by these equations are intersecting at a unique point.

(iv) $2x + 3y - 5 = 0$ and $px - 6y - 8 = 0$,

if the pair of equations has a unique solution.

(v) $2x + 3y = 7$ and $2px + py = 28 - qy$,

if the pair of equations has infinitely many solutions.

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24. Two straight paths are represented by the equations $x - 3y = 2$ and $-2x + 6y = 5$. Check whether the paths cross each other or not.

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25. If $2x + y = 23$ and $4x - y = 19$, then find the values of $5y - 2x$ and $\frac{y}{x} - 2$.

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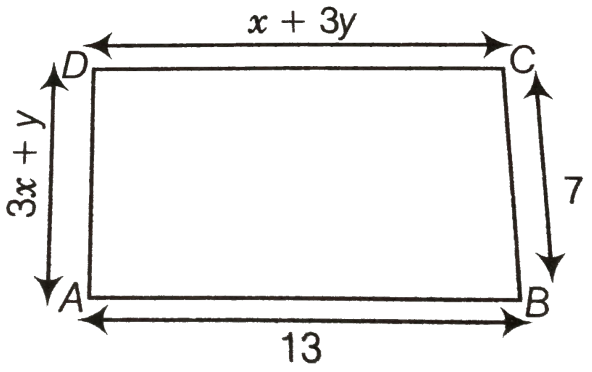
26. Find the values of x and y in the following rectangle



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27. 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 $y=\lambda x+5$.

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28. By the graphical method, find whether the following pair of equations are consistent of not. If consistent, solve them.

(i)$3x + y + 4 = 0, 6x - 2y + 4 = 0$

(ii) $x - 2y = 6, 3x - 6y = 0$

(iii) $x + y = 3, 3x + 3y = 9$

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29. Draw the graph of the pair of equations 2x+y=4 and 2x-y=4. Write the vertices of the triangle formed

by these lines and the y-axis, find the area of this triangle?

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30. Write an equation of a line passing through the point representing solution of the pair of linear equations x+y=2 and 2x-y=1, How many such lines can we find?

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31. 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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32. If the angles of a triangle are x, y and 40° and the difference between the two angles x and y is 30°. Then, find the value of x and y.

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33. Two years ago, Salim was thrice as old as his daughter and six years later, he will be four year older than twice her age. How old are they now?

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34. 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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35. Two numbers are in the ratio 5 : 6. If 8 is subtracted from each of the numbers, the ratio becomes 4 : 5, then find the numbers.

A. $x = 42, y = 44$

B. $x = 48, y = 40$

C. $x = 40, y = 48$

D. $x = 50, y = 40$

Answer: C

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36. 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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37. A shopkeeper gives books on rent for reading. She takes a fixed charge for the first two days and an additional charge for each day thereafter. Latika paid Rs. 22 for a book kept for six days, while Anand paid Rs. 16 for the book kept for four days. Find the fixed charges and the charge for each extra day.

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38. In a competitive examination, 1 mark is awarded for each correct answer while 1/2 mark is deducted for every wrong answer. Jayanti answered 120 questions

and got 90 marks. How many questions did she answer correctly?

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39. The angles of a cyclic quadrilateral ABCD are $\angle A = (6x + 10)^\circ, \angle B = (5x)^\circ, \angle C = (x + y)^\circ$ and $\angle D = (3y - 10)^\circ$.

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40. Graphically, solve the following pair of equations

2x+y=6 and 2x-y+2=0

Find the ratio of the areas of the two triangles formed

by the lines representing these equations with the X-axis and the lines with the y-axis.

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41. Determine graphically, the vertices of the triangle formed by the lines

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

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42. Draw the graphs of the equations $x=3$, $x=5$ and $2x-y-4=0$. Also find the area of the quadrilateral formed by the lines and the X-axis.

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43. 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.

A. 15

B. 10

C. 5

D. 20

Answer: B

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44. Determine, algebraically, the vertices of the triangle formed by the lines

3x-y=3

2x-3y=2

and $x + 2y = 8$

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45. 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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46. 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.

A. 5.2 km/h

B. 2.5 km/h

C. 3 km/h

D. none of these

Answer: B

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47. A ,motorboat can travel 30 km upstream and 28 km downstream in 7 h. It can travel 21 km upstream and return in 5 h. Find the speed of the boat in still water and the speed of the stream.

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48. A two-digit number is obtained by either multiplying the sum of the digits by 8 and then

subtracting 5 or by multiplying the difference of the digits by 16 and then adding 3. Find the number.

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49. A railway half ticket cost half the full fare but the reservation charges are the same on a half ticket as on a full ticket. One reserved first class ticket from the stations A to B costs Rs. 2530. Also, one reserved first class ticket and one reserved first class half ticket from stations A to B costs Rs. 3810. Find the full first class fare from stations A to B and also the reservation charges for a ticket.

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50. A shopkeeper sells a saree at 8% profit and a sweater at 10% discount, thereby, getting a sum Rs 1008. If she had sold the saree at 10% profit and the sweater at 8% discount, she would have got Rs 1028 then find the cost of the saree and the list price (price before discount) of the sweater.

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51. 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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52. Vijay had some bananas and he divided them into two lots A and B. He sold the first lot at the rate of RS. 2 for 3 bananas and the second lot at the rate of Rs 1 per banana and got a total of Rs. 400. If he had sold the first lot at the rate of Rs. 1 per banana and the second lot at the rate of Rs.4 for 5 bananas , his total

collection would have been Rs 460. Find the total number of bananas he had.

A. 500

B. 600

C. 700

D. 800

Answer: A

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Exercise 3 3 Short Answer Type Questions

1. Write a pair of linear equations which has the unique solution $x = -1$ and $y = 3$. How many such pairs can you write ?

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2. Solve the following pairs of equations

(i) $x + y = 3.3, \quad \frac{0.6}{3x - 2y} = -1, 3x - 2y \neq 0$

(ii) $\frac{x}{3} + \frac{y}{4} = 4, \quad \frac{5x}{6} - \frac{y}{8} = 4$

(iii) $4x + \frac{6}{y} = 15, \quad 6x - \frac{8}{y} = 14, y \neq 0$

(iv) $\frac{1}{2x} - \frac{1}{y} = -1, \quad \frac{1}{x} + \frac{1}{2y} = 8, x, y \neq 0$

(v) $43x + 67y = -24, \quad 67x + 43y = 24$

(vi) $\frac{x}{a} + \frac{y}{b} = a + b, \quad \frac{x}{a^2} + \frac{y}{b^2} = 2, a, b \neq 0$

(vii)

$$\frac{2xy}{x+y}=\frac{3}{2},\qquad \frac{xy}{2x-y}=\frac{-3}{10},\ x+y\neq 0,\ 2x-y\neq 0$$

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