MATHS

BOOKS - EDUCART PUBLICATION

PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

Objective Type Questions Multiple Choice Questions

1. the pair of linear equations

$3x/2+5y/3 =7$ and $9x + 10y =14$ is

(a) consistent

(b) inconsistent

(c) consistent with one solution

(d) consistent with many solutions

A. consistent

B. inconsistent

C. consistent with one solution

D. consistent with many solutions

Answer: B

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2. 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 at exactly two points

C. coincident

D. parallel.

Answer: D

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3. If a pair of linear equations is consistent then their graph lines will be

A. parallel

B. always coincident

C. intersecting or coincident

D. always intersecting

Answer: C

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4. Find k for which the system $x + 2y = 3$ and $5x + ky + 7 = 0$ is inconsistent.

A. $-\frac{14}{3}$

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

C. 5

D. 10

Answer: D

5. Write the value of k for which the system of equations $x + y - 4 = 0$ and $2x + ky - 3 = 0$ has no solution

A. -2

B. $\neq 2$

C. 3

D. 2

Answer: D

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6. 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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7. 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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8. For which value(s) of ρ will the lines represented by the following pair of linear equations be paralle

$3x - y - 5 = 0$

$6x - 2y - p = 0$

A. all real values except 10

B. 10

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

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

Answer: A

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9. 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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10. The pair of equations $x = 0$ and $x = -4$ has _____ solution.

A. a unique solution

B. no solution

C. infinitely many solution

D. only solution (0,0)

Answer: B

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11. 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. $-10x + 14y + 4 = 0$

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

Answer: D

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

A. $x + y = -1$ and 2x - 3y = -5

B. 2x + 5y = -11 and 4x + 10 y =-22

C. 2x - y = 1 and 3x + 2y = 0

D. x - 4y - 14 = 0 and 5x - y - 13 = 0

Answer: D

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13. 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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14. 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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Objective Type Questions Fill In The Blanks True False

1. Find the value of k for which pair of linear equations $3x + 2y = -5$ and $x - ky = 2$ has a unique solution.

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2. Find the value of a so that the point (3,a) lies on the line represented by 2x-3y=5

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3. The co-ordinate where the line x-y = 8 will intersect y-axis is .....

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4. 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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5. Solve the following pair of equations:

$x + 2y = 8$

$2x - 3y = 26.$

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6. If $x - y = 2$ and $\frac{2}{x+y} = \frac{1}{5}$ then x = ...

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7. The value of p for the following pair of linear equations (p - 3)x + 3y = p , px + py =12 have infinitely many solutions is .....

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8. If x =a , y = b is the solution of the pair of equation x - y = 2 and x + y = 4 then the value of 3a + 4b is ..... .

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9. The value of λ for the pair of equations to have infinitely many solutions is

$\lambda x + 3y = -4$

$x - 6y = 8$

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10. For the real values of c , the pair of equations

$x - 2y = 8$

$5x - 10y = c$

have a unique solution . Justify whether it is true or false.

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Objective Type Questions Very Short Questions

1. Write the relationship between the coefficients , if the following pair of equations are inconsistent.

$ax + by + c = 0$, $a'x + b'y + c' = 0$.

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

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3. The system $kx - y = 2$ and $6x - 2y = 3$ has a unique solution only when

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4. Find the solution of x + y = 3 and 7x + 6y = 2.

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Short Answer Sa I Type Questions 2 Marks

1. Find the value(s) of k for which the pair of equations $\begin{cases} kx + 2y = 3 \\ 3x + 6y = 10 \end{cases}$ has a unique solution.

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2. The larger of two supplementary angles exceeds the smaller by 18° . Find the angles .

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3. In a ABC, $\angle A = xo$, $\angle B = 3xo$ and $\angle C = yo$. If $3y - 5x = 30$, prove that the triangle is right angled.

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4. Find c if the system of equations cx + 3y + (3 - c) = 0 , 12 x + cy - c = 0 has infinitely many solutions ?

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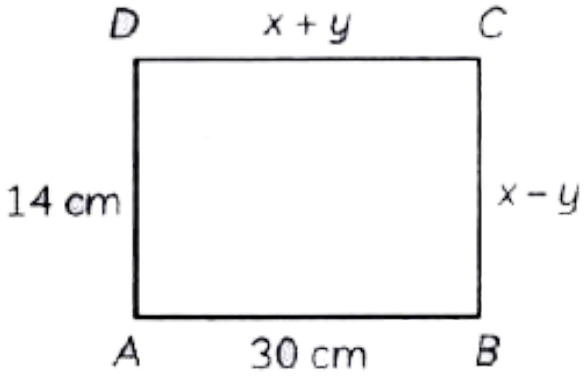
5. In the figure , ABCD is a rectangle . Find the values of x and y .



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6. For what value of k does the system of linear equations $2x + 3y = 7$

$(k-1)x+(k+2)y=3k$ have an infinite number of solutions

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

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8. 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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9. 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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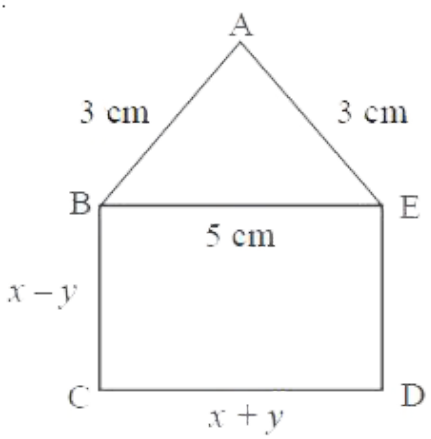
10. ABCDE is a pentagon with $BE||CD$ and $BC||DE$, BC is perpendicular to CD If the perimeter of ABCDE is 21 cm, find x and y.



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Short Answer Sa Ii Type Questions 3 Marks

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

$x + 2y = 1$

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

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3. Write a pair of linear equations which has the unique solution x = 3 , y = -2 . How many such pairs can you write ?

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4. Solve the pair of equations :

$$\frac{3}{x} + \frac{2}{y} = 7$$

$$\frac{5}{x} - \frac{4}{y} = 13$$

Hence find the value of 27x - 12y .

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5. 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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6. 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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7. The present age of a father is three years more than three times the age of the son. Three years hence fathers age will be 10 years more than twice the age of the son. Determine their present ages.

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8. The taxi charges in a city comprise of a fixed charge together with the charge for the distance covered. For a journey of 10 km the charge paid is Rs 75 and for a journey of 15 km the charge paid is Rs 110. What will a person have to pay for travelling a distance of 25 km?

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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. 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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11. Determine the vertices of a triangle, equations of whose sides are given by $3y + x = 5, 2y - x = 11$ and $3y + 2x = 7$.

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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.

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13. 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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14. 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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15. Fathers age is three times the sum of ages of his two children. After 5 years his age will be twice the sum of ages of two children. Find the age of father.

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16. Solve the following system of equations :

$$\frac{21}{x}+\frac{47}{y}=110$$

$$\frac{47}{x}=\frac{21}{y}=162, x, y \neq 0$$

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17. The sum of the reciprocals of Rehmans ages, (in years) 3 years ago and 5 years from now is $\frac{1}{3}$. Find his present age.

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18. Solve the pair of given linear equation:

$4x + 3y = 7$

$2x - y = 11$

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19. Solve the following pair of linear equations:

$8s - 3h = -9$

$-3s + h = 1$

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20. Find the solution of the pair of equations :

$\frac{3}{x} + \frac{8}{y} = -1, \frac{1}{x} - \frac{2}{y} = 2, x, y \neq 0$

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21. Ratio between the girls one long 11 class of 40 students is 2:3 five, new students joined the class how many of them must be boys so that the both between girls and boys became 4:5?

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22. I am three times as old as my son. Five years later, I shall be two and a half times as old as my son. How old am I and how old is my son?

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23. A two digit number is four times the sum of the digits. It is also equal to 3 times the product of digits. Find the number.

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24. A and B each have a certain number of mangoes. A says to B, if you give 30 of your mangoes, I will have twice as many as left with you. B replies, if you give me 10, I will have thrice as many as left with you. How many mangoes does each have?

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Long Answer Type Questions 4 Marks

1. 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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2. It takes 12 hours to fill a swimming pool using two pipes . If the pipes of larger diameter is used for 4 hours and the pipe of smaller diameter is used for 9 hours , only half of the pool is filled. How long would it take for each pipe to fill the pool separately?

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3. 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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4. 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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5. 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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6. 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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7. 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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8. Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of larger diameter takes 10

hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.

9. 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. for 5 bananas , his total collection would have been Rs 460. Find the total number of bananas he had.

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10. 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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