MATHS

BOOKS - TARGET PUBLICATION

LINEAR EQUATIONS IN TWO VARIABLES

Try This

1. Solve the above equations by method of elimination.Check your solution with the solution obtained by graphical method. $x - y = 1, 5x - 3y = 1$

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2. Draw graphs of `x-2y=4,2x-4y=12 on the same co-ordinate plane.Observe it.Think of the solutions of the given equations.

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3. What are the conditions such that equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ have (i) unique solution (ii) No solution (iii) Infinite solution.

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4. Solve the following simultaneous equations: $\frac{4}{x} + \frac{3}{y} = 1, \frac{8}{x} - \frac{9}{y} = 7$

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5. Solve the simultaneous equations :

$$\frac{4}{x}+\frac{5}{y}=7, \frac{3}{x}+\frac{4}{y}=5$$

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6. Solve the simultaneous equations :

$$\frac{4}{x-y}+\frac{1}{x+y}=3, \frac{2}{x-y}-\frac{3}{x+y}=5$$

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Practive Set 11

1. Complete the following activity to solve the simultaneous equations $2x+y=19$ and $2x-3y=-3$ by Cramer's rule.

$$D=\begin{vmatrix}2 & 1\\ 2 & -3\end{vmatrix}=\square, D_x=\begin{vmatrix}19 & 1\\ -3 & -3\end{vmatrix}=\square, D_y=\begin{vmatrix}2 & 19\\ 2 & -3\end{vmatrix}=\square,$$

$$x=\square, y=\frac{11}{2}$$

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2. $3a + 5b = 26; a + 5b = 22$

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3. Solve the following simultaneous equations.

$x + 7y = 10, 3x - 2y = 7.$

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4. Simultaneous equations

$3x - 3y = 9, 2x + y = 13$

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5. Solve the following simultaneous equations.

$5m - 3n = 19, m - 6n = -7.$

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6. Simultaneous equations

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

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7. Solve the following simultaneous equations.

$\frac{1}{3}x + y = \frac{10}{3}, 2x + \frac{1}{4}y = \frac{11}{4}.$

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8. Solve the following simultaneous equations.

$99x + 101y = 499, 101x + 99y = 501.$

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9. Solve the following simultaneous equations.

$49x - 57y = 172, 57x - 49y = 252.$

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Practive Set 1 2

1. Draw graph of the equations.

$x + y = 3$

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2. Draw graph of the equations.

$x - y = 4$

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3. Solve the following simultaneous equations graphically.

$x + y = 6, x - y = 4.$

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4. Solve the following simultaneous equations graphically,

$x + y = 5, x - y = 3.$

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5. Solve the following simultaneous equations graphically, $x + y = 0, 2x - y = 9.$

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6. Solve the following simultaneous equations graphically, $3x - y = 2, 2x - y = 3.$

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7. Solve the following simultaneous equations graphically, $3x - 4y = -7, 5x - 2y = 0.$

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8. Solve the following simultaneous equations graphically, $2x - 3y = 4, 3y - x = 4.$

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Practive Set 1 3

1. Find the value of the determinant $\begin{vmatrix} -1 & 7 \\ 2 & 4 \end{vmatrix}$

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2. Find the value of the determinant $\begin{vmatrix} 5 & 3 \\ -7 & 0 \end{vmatrix}$

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3. Find the value of the determinant $\begin{vmatrix} \frac{7}{3} & \frac{5}{3} \\ \frac{3}{2} & \frac{1}{2} \end{vmatrix}$

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4. Solve the following simultaneous equations using Cramer's rule.

$3x - 4y = 10, 4x + 3y = 5.$

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5. Solve the following simultaneous equations using Cramer's rule.

$4x + 3y - 4 = 0, 6x = 8 - 5y.$

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6. Solve the following simultaneous equations using Cramer's rule.

$x + 2y = -1, 2x - 3y = 12.$

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7. Solve the following simultaneous equations using Cramer's rule

$6x - 4y = -12, 8x - 3y = -2.$

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8. Solve the following simultaneous equations using Cramer's rule

$4m + 6n = 54, 3m + 2n = 28.$

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9. Solve the following simultaneous equations using Cramer's rule $2x + 3y = 2, x - \frac{y}{2} = \frac{1}{2}.$

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Practive Set 1 4

1. Solve the following simultaneous equations $\frac{2}{x} - \frac{3}{y} = 15, \frac{8}{x} + \frac{5}{y} = 77.$

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2. Solve the following simultaneous equations $\frac{10}{x+y} + \frac{2}{x-y} = 4, \frac{15}{x+y} - \frac{5}{x-y} = -2.$

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3. Solve the following simultaneous equations $\frac{1}{3x+y}+\frac{1}{3x-y}=\frac{3}{4}, \frac{1}{2(3x+y)}-\frac{1}{2(3x-y)}=-\frac{1}{8}$.

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Practive Set 1 5

1. Two numbers differ by 3.The sum of twice the smaller number and thrice the greater number is 19. Find the numbers.

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2. The denominator of a fraction is 4 more than twice the numerator. Denominator becomes 12 times the numerator,if both the numerator and denominator are reduced by 6. Find the fraction.

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3. Two types of boxes A and B are to be placed in a truck having capacity of 10 tons. When 150 boxes of type A and 100 boxes of type B are loaded in the truck, it weighs 10 tons. But when 260 boxes of type A are loaded in the truck, it can still accommodate 40 boxes of B so that it is fully loaded. Find the weight of each type of box.

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4. Out of 1900 km,Vishal travelled some distance by bus and some by aeroplane. Bus travels with average speed 60km/hr and the average speed of aeroplane is 700 km/hr.It takes 5 hours to complete the journey. Find the distance travelled by Vishal in bus.

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Lets Recall

1. Draw the graph of the equation $3x + 2y - 13 = 0$

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2. Draw the graph of the equation $5x - y - 14 = 0$

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3. Draw the graph of the equation $2x + y = 0$.

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Simultaneous Linear Equations

1. Solve : $4x - 5y = 172, 5x - 4y = 251$

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Problem Set 1

1. Find the value of: $\begin{vmatrix} 5 & 3 \\ -7 & -4 \end{vmatrix}$

$a) -1$

$b) -41$

$c) 41$

$d) 1$

A. -1

B. -41

C. 41

D. 1

Answer: D

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2. Solve the following simultaneous equations using Cramer's rule.

$4m - 2n = -4, 4m + 3n = 16.$

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3. Kantabai bought 1.5kg tea and 5kg sugar from a shop. She paid ₹50 as fare for rickshaw. Total expense was ₹700.Then she realised that by ordering online the goods can be bought with free home delivery at the same price. So next month she placed the order online for 2 kg tea and 7kg sugar and paid ₹880 .Find the rate of sugar and tea per kg.

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Multiple Choice Questions

1. If x + y = 10 and x - y = 12, then

A. x = 11, y = 1

B. x = 11, y = -1

C. x = -11, y = 1

D. x = -11, y = -1

Answer:

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2. If x - y = 10 and x = 2y, then

A. x =20, y = 20

B. x = 20, y = 10

C. x = 20, y = 0

D. x = -20, y = 10

Answer:

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3. If $11x + 4y = 33$ and $4x + 11y = 12,$ then x + y =

A. 3

B. -3

C. 5

D. -5

Answer: A

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4. The value of m for which the value of the determinant $\begin{vmatrix} -3 & m \\ -5 & -4 \end{vmatrix} =$ is-18 is

A. 3

B. -3

C. 6

D. -6

Answer: D

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5. Which of the following will give the solution of simultaneous equation by Cramer's rule ?

A. $x = \frac{D}{D_x}, y = \frac{D}{D_y}$ where $D \neq 0$

B. $x = \frac{D_x}{D}, y = \frac{D}{D_y}$ where $D \neq 0$

C. $x = \frac{D}{D_x}, y = \frac{D_y}{D}$ where $D \neq 0$

D. $x = \frac{D_x}{D}, y = \frac{D_y}{D}$ where $D \neq 0$

Answer: D

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6. If $D_x = 20$ and $D = 5$, then x=

A. 20

B. 25

C. 4

D. $\frac{1}{4}$

Answer: C

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7. For the simultaneous equations $3x - 8y = 5$ and $x + 2y = 1$

A. $D_x = 18, D_y = -2$

B. $D_x = 10, D_y = -2$

C. $D_x = 18, D_y = 10$

D. $D_x = -18, D_y = 2$

Answer: A

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8. Sum of two numbers is 35 and their difference is 13. Find the numbers.

A. 23 and 12

B. 24 and 11

C. 25 and 11

D. 21 and 14

Answer: B

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Based On Practice Set 1 1

1. Solve x + y = 7 and 3x - 2y = 11.

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2. Solve the simultaneous equations: $2x + 3y = 7, 3x - y = 5$

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3. Solve the simultaneous equations: $5x - 3y = 8, 3x + y = 2$

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4. Solve the simultaneous equations: $8x - 3y = 1, 34x - 3y = 14$

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5. Solve the simultaneous equations: $2x + y = 10, 3x + 4y = 25$

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6. Solve 3x - 4y = 20 and x + 2y = 5.

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7. Solve the simultaneous equations:

$4x + \frac{y}{3} = \frac{8}{3}, \frac{x}{2} + \frac{3y}{4} = -\frac{5}{2}$

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8. Solve the simultaneous equations: $x + 11y = 1, 8x + 13y = 2$

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9. Solve the simultaneous equations:

$15x + 17y = 21, 17x + 15y = 11$

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Based On Practice Set 1 2

1. Solve the simultaneous equations by using Graphical method

$4x = y - 5, y = 2x + 1$

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2. Solve the silultaneous equations by using Graphical method

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

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Based On Practice Set 1 3

1. Find the value of the determinants:

$$\begin{vmatrix} 2 & 5 \\ -1 & 3 \end{vmatrix}$$

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2. Find the value of the determinants:

$$\begin{vmatrix} 3 & 3 \\ 2 & 16 \end{vmatrix}$$

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3. Find the value of the determinant:

$$\begin{vmatrix} 4 & -2 \\ 3 & 1 \end{vmatrix}$$

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4. Find the value of the determinants:

$$A = \begin{vmatrix} 5 & 3 \\ 3 & 1 \end{vmatrix}$$

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5. Find the value of the determinants:

$$N = \begin{vmatrix} -8 & -3 \\ 2 & 4 \end{vmatrix}$$

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6. Find the value of the determinant : $\begin{vmatrix} -3 & 8 \\ 6 & 0 \end{vmatrix}$

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7. Find the value of the determinants: $B = \begin{vmatrix} 2\sqrt{3} & 9 \\ 2 & 3\sqrt{3} \end{vmatrix}$

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8. Find the value of the determinants:

$$\begin{vmatrix} \frac{1}{4} & -\frac{2}{3} \\ -\frac{1}{2} & \frac{1}{3} \end{vmatrix}$$

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9. For solving the following sikmultaneous equations by Cramer's rule, find the values of D_x and D_y : $3x - y = 7, x + 4y = 11$

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10. Solve the simultaneous equations using Cramer's rule :

$x + y = 10, x - y = 2$

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11. Solve the simultaneous equations using Cramer's rule :

$3x - y = 7, x + 4y = 11$

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12. Solve the simultaneous equations using Cramer's rule :

$y = 2x - 19, 2x - 3y + 3 = 0$

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13. Solve the simultaneous equations using Cramer's rule :

$3x - 4y = 7, 5x + 2y = 3$

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14. Solve the simultaneous equations using Cramer's rule :

$5x + 3y = -11, 2x + 4y = -10$

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15. Solve the simultaneous equations using Cramer's rule :

$y = \frac{5x - 10}{2}, 4x + y = -5$

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16. Solve the simultaneous equations using Cramer's rule :

$3x + 2y + 11 = 0, 7x - 4y = 9$

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17. Solve the simultaneous equations using Cramer's rule :

$4x + 3y = 18, 3x - 2y = 5$

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Based On Practice Set 1 4

1. Solve the simultaneous equations : $\frac{1}{x}+\frac{1}{y}=8, \frac{4}{x}-\frac{2}{y}=2$

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2. Solve the simultaneous equations :

$\frac{4}{x}+\frac{5}{y}=7, \frac{3}{x}+\frac{4}{y}=5$

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Based On Practice Set 1 5

1. The sum of two numbers is 146 and their difference is 18. Find the numbers.

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2. Difference between two numbers is 30. Twice the greater number is less than 7 times the smaller number by 5. Find the numbers.

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Chapter Assessment

1. If $2x - 3y = 14$ and $5x + 2y = 16$ than

A. $x = 2, y = 4$

B. $x = -2, y = 4$

C. $x = 4, y = 2$

D. $x = 4, y = -2$

Answer: D

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2. $\begin{vmatrix} -11 & 2 \\ 9 & -4 \end{vmatrix} =$

A. 13

B. -13

C. 26

D. -26

Answer: C

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3. If the difference between two numbers is 36 and one number is 4 times the other number, then the numbers are

A. 60 and 24

B. 48 and 12

C. 56 and 14

D. 48 and 24

Answer: B

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4. Find the value of the following determinates:

$$\begin{vmatrix} 3 & -11 \\ 7 & 9 \end{vmatrix}$$

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5. Find the value of the following determinates:

$$\begin{vmatrix} \frac{4}{7} & \frac{-6}{35} \\ 2 & \frac{2}{5} \end{vmatrix}$$

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6. For simultaneous equations in variables x and y, if $D_x = -14, D_y = 7$ and $D = -35,$ then find the values of x and y.

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7. Complete the following table to draw graph of the equations.

View Text Solution

8. There are some instructions given below. Freme the equations form the information and write them in the blank boxes shown by arrows.

View Text Solution

9. Solve the following simultaneous equations. $2x + 3y = -4, x - 5y = 11$

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10. The permeter of an isosceles triangle is 24 cm. The length of its congruent sides is 13 cm less then twice the length of its base. Find the lengths of all sides of the triangle.

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11. Draw the graphs representing the equations $2x - y = 2$ and $4x + 3y = 24$ on the same graph paper. Find thearea of the triangles formed by these lines, the X-axis and the Y-axis.

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12. Sum of two numbers is 97. If the greater number is divided by the the smaller, the quotient is 7 and the remainder is 1. Find the numbers.

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