



MATHS

BOOKS - TARGET MATHS (HINGLISH)

LINEAR EQUATIONS IN TWO VARIABLES

Try This

1. Solve the above equations by method of elimination. $x - y = 1$ and

$$5x - 3y = 1$$

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2. Draw graphs of $x - 2y = 4$, $2x - 4y = 12$ on the same coordinate plane. Observe it. Think of the relation between the

coefficients of x , coefficients of y and the constant terms and draw the inference.



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3. What is the nature of solution $D = 0$?



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4. 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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5. Which of the following is not a linear equation



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6. Solve the following simultaneous equations :

$$\frac{4}{x} + \frac{3}{y} = 1, \quad \frac{8}{x} - \frac{9}{y} = 7.$$

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7. Fill in the boxes : (a) (b) (c)

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8. Solve the simultaneous equations :

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

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9. 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 1 1

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. Simultaneous equations

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



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4. Solve the Simultaneous equations

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



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5. Solve the 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. Simultaneous equations

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



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8. Solve $99x + 101y = 499$; $101x + 99y = 501$



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9. $49x - 57y = 172$, $57x - 49y = 252$



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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 13

1. Find the values of following determinants.

$$\begin{vmatrix} -1 & 7 \\ 2 & 4 \end{vmatrix}$$

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2. Find the values of following determinants.

$$\begin{vmatrix} 5 & 3 \\ -7 & 0 \end{vmatrix}$$

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3. Find the values of following determinants.

$$\begin{vmatrix} \frac{7}{3} & \frac{5}{3} \\ \frac{3}{2} & \frac{1}{2} \end{vmatrix}$$

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4. Solve the simultaneous equations using Cramer's rule

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

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5. Solve the simultaneous equations using Cramer's rule

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



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6. Solve the simultaneous equations using Cramer's rule

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



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7. Solve the simultaneous equations using Cramer's rule

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



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8. Solve the simultaneous equations using Cramer's rule

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

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9. Solve the 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 simultaneous equations.

$$\frac{2}{x} - \frac{3}{y} = 15, \frac{8}{x} + \frac{5}{y} = 77$$

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2. Solve the simultaneous equations.

$$\frac{10}{x+y} + \frac{2}{x-y} = 4, \quad \frac{15}{x+y} - \frac{5}{x-y} = -2$$

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3. Solve the simultaneous equations.

$$\frac{27}{x-2} + \frac{31}{y+3} = 85, \quad \frac{31}{x-2} + \frac{27}{y+3} = 89$$

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4. Solve the following system of equations:

$$\frac{1}{3x+y} + \frac{1}{3x-y} = \frac{3}{4}, \quad \frac{1}{2(3x+y)} - \frac{1}{2(3x-y)} = -\frac{1}{8}$$

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

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2. The sum of father's age and twice the age of his son is 70. If we double the age of the father and add it to the age of his son the sum is 95. Find their present ages.

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

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

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

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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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1. Solve : $3x + 2y = 29$, $5x - y = 18$



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



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Problem Set 1

1. For drawing the graph of $4x + 5y = 19$, if $x = 1$, what is the value of y ?

A. 4

B. 3

C. 2

D. -3

Answer: B

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2. For simultaneous equations in variables x and y ,

$D_x = 49$, $D_y = -63$, $D = 7$ then what is x ?

A. 7

B. -7

C. $\frac{1}{7}$

D. $\frac{-1}{7}$

Answer: A

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3. Find the value of

$$\begin{vmatrix} 5 & 3 \\ -7 & -4 \end{vmatrix}$$

A. -1

B. -41

C. 41

D. 1

Answer: D



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4. To solve $x + y = 3$, $3x - 2y - 4 = 0$ by determinant method find D.

A. 5

B. 1

C. -5

D. -1

Answer: C



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5. $ax + by = c$ and $mx + ny = d$. If $an \neq bm$, then these simultaneous equations have

A. Only one common solution

B. No solution

C. Infinite number of solution

D. Only two solution

Answer: A



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6. Solve the simultaneous equations graphically.

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

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7. Solve the simultaneous equations graphically.

$$x - 3y = 1, 3x - 2y + 4 = 0$$

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8. Solve the simultaneous equations graphically.

$$5x - 6y + 30 = 0, 5x + 4y - 20 = 0$$

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9. Solve the simultaneous equations graphically.

$$3x - y - 2 = 0, 2x + y = 8$$

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10. Solve the simultaneous equations graphically.

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

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11. Find the values of each of the following determinants.

$$\begin{vmatrix} 4 & 3 \\ 2 & 7 \end{vmatrix}$$

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12. Find the values of each of the following determinants.

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



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13. Find the values of each of the following determinants.

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



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14. Solve the following equations by Cramer's method.

$$6x - 3y = -10, 3x + 5y - 8 = 0$$



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15. Solve the following equations by Cramer's method.

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



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16. Solve the following equations by Cramer's method.

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



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17. Solve the following equations by Cramer's method.

$$7x + 3y = 15, 12y - 5x = 39$$



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18. Solve the following equations by Cramer's method.

$$\frac{x + y - 8}{2} = \frac{x + 2y - 14}{3} = \frac{3x - 4}{4}$$

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19. Solve the following simultaneous equations

$$\frac{2}{x} + \frac{2}{3y} = \frac{1}{6}, \quad \frac{3}{x} + \frac{2}{y} = 0$$

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20. Solve the following simultaneous equations:

$$\frac{7}{2x + 1} + \frac{13}{y + 2} = 27, \quad \frac{13}{2x + 1} + \frac{7}{y + 2} = 33$$

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21. Solve the following simultaneous equations

$$\frac{148}{x} + \frac{231}{y} = \frac{527}{xy}, \quad \frac{231}{x} + \frac{148}{y} = \frac{610}{xy}$$



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22. Solve the following system of equations:

$$\frac{7x - 2y}{xy} = 5, \quad \frac{8x + 7y}{xy} = 15$$



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23. Solve the following simultaneous equations

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



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24. A two digit number and the number with digits interchanged add up to 143. In the given number the digit in unit's place is 3 more than the digit in the ten's place. Find the original number.



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25. Kantabai bought $1\frac{1}{2}$ kg tea and 5 kg sugar from a shop. She paid ₹ 50 as return 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 7 kg sugar. She paid ₹ 880 for that. Find the rate of sugar and tea per kg.



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26. Sum of the present ages of Manish and Savita is 31. Manish's age 3 years ago was 4 times the age of Savita. Find their present ages.

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27. In a factory the ratio of salary of skilled and unskilled workers is 5 : 3. Total salary of one day of both of them is ₹ 720. Find daily wages of skilled and unskilled workers.

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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. $\begin{vmatrix} \frac{1}{3} & 4 \\ \frac{-1}{6} & \frac{3}{2} \end{vmatrix} =$

A. $\frac{7}{6}$

B. $\frac{-7}{6}$

C. $\frac{1}{6}$

D. $\frac{-1}{6}$

Answer: A

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5. The value of m for which the value of the determinant

$$\begin{vmatrix} -3 & m \\ -5 & -4 \end{vmatrix} = -18$$

A. 3

B. -3

C. 6

D. -6

Answer: D

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6. 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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7. 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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8. 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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9. 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:

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

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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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10. Solve the simultaneous equations:

$$49x + 51y = 499, 51x + 49y = 501$$

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11. Solve the simultaneous equations: Draw graph of $2x - y = 4$

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1. Solve the simultaneous equations by using Graphical method

$$x + y = 7, x - y = 5$$

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2. Solve the simultaneous equations by using Graphical method

$$x + y = 8, x - y = 2$$

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3. Solve the simultaneous equations by using Graphical method

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

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4. Solve the simultaneous equations by using Graphical method

$$x + y = 7, 2x - 3y = 9$$

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5. Solve the simultaneous equations by using Graphical method

$$y = 6 - 3x, y = 4 - x$$

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6. Solve the simultaneous equations by using Graphical method

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

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7. Solve the simultaneous equations by using Graphical method

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



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8. Solve the simultaneous equations by using Graphical method

$$3x + 4y + 5 = 0, x - y = -4$$



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Based On Practice Set 13

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 simultaneous 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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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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3. Solve the simultaneous equations :

$$\frac{1}{3x} - \frac{1}{4y} + 1 = 0, \frac{1}{5x} + \frac{1}{2y} = \frac{4}{15}$$

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4. Solve the simultaneous equations :

$$\frac{6x + 3y}{xy} = 6, \frac{2x + 4y}{xy} = 5$$



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$$5. \frac{5}{x-1} + \frac{1}{y-2} = 2 \frac{6}{x-1} - \frac{3}{y-2} = 1$$



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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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7. Solve the simultaneous equations :

$$\frac{10}{x+y} + \frac{2}{x-y} = 4, \frac{5}{x+y} - \frac{5}{3(x-y)} = \frac{-2}{3}$$



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8. Solve the following system of equations:

$$\frac{2}{3x + 2y} + \frac{3}{3x - 2y} = \frac{17}{5}, \quad \frac{5}{3x + 2y} + \frac{1}{3x - 2y} = 2$$

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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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3. Sum of ages of mother and her daughter is 60 years. After 15 years mother's age will be twice as that of her daughter's age at that time. Find their present ages.



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4. The perimeter of a rectangle is 40 cm. The length of the rectangle is more than double its breadth by 2. Find length and breadth.



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5. The perimeter of an isosceles triangle is 30 cm. The length of its congruent sides is 3 cm more than its base. Find the lengths of all the sides.



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6. On the first day of the sale of tickets of a drama, in all 35 tickets were sold. If the rates of the tickets were Rs. 20 and Rs. 40 per ticket and the total collection was Rs. 900. Find the number of tickets sold at each rate.

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7. A certain amount is equally distributed among certain number of students. Each would get ₹ 2 less if 10 students were more and each would get ₹6 more if 15 students were less. Find the number of students and the amount distributed.

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8. Students of a school were made to stand in rows for drill. If 3 student less were standing in each row, 10 more rows were required

and if 5 students more were standing in each row then the number of rows was reduced by 10. Find the number of students participating in the drill.



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9. A boat takes 10 hours to travel 30 km upstream and 44 km downstream, but it takes 13 hours to travel 40 km upstream and 55 km downstream. Find the speed of the boat in still water and the speed of the stream.



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Chapter Assessment

1. A three digit number is equal to 17 times the sum of its digits. If 198 is added to the number, the digits get reserved. The sum of the

extreme digits is 1 less than the middle digit. Find the number.



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2. To draw the graph of $6x + 7y = 19$, find x when $y = 1$

A. 2

B. -2

C. 3

D. -3

Answer: A



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

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

A. 13

B. -13

C. 26

D. -26

Answer: C



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5. 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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6. Find the value of the following determinates:

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



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7. 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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8. 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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9. Complete the following table to draw graph of the equations.



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10. There are some instructions given below. Form the equations from the information and write them in the blank boxes shown by arrows.



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11. Solve the following simultaneous equations.

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



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12. Solve the following simultaneous equations by Graphical method : $4x - y = 6$, $3x + 5y = 16$

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

$$3x + y = 1, 2x - 11y = 3$$

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14. Solve the following simultaneous equations :

$$\frac{16}{x+y} + \frac{2}{x-y} = 1, \frac{8}{x+y} - \frac{12}{x-y} = 7$$

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15. The perimeter of an isosceles triangle is 24 cm. The length of its congruent sides is 13 cm less than twice the length of its base. Find the lengths of all sides of the triangle.

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

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



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18. 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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19. Draw the graph of the equation $x + 2y = 4$ and $3x + 6y = 12$. What do you observe ? How many solutions do the equation have ? Write your conclusion.

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20. Cramer's rule, what is the nature of solution if $D = 0$? Explain with the help of an example.



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