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# RISE UP अॅकॅडमी

**इयत्ता : 5 वी ते 10 वी**

**आदर्श कॉलनी, औसा रोड, बरमदे हॉस्पिटल जवळ, लातूर**

Class: 10 English / Semi-English (State) | Subject : Algebra | Total Marks: 40

Date: | Chapter: Linear Equations in two variables | Time: 2hr

**10th Algebra 40 Marks**

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**Q.1) A) Choose the correct alternative for the following questions** [04]

1) To solve x + y = 3 ; 3x – 2y – 4 = 0 by determinant method find D.

a) 5 b) 1 c) -5 d) -1

2) For drawing the graph of 5x + 2y = 16, if x = 2, what is the value of y?

a) $\frac{11}{2}$ b) 8 c) 3 d) $\frac{14}{5}$

3) For simultaneous equations in x and y, if D = 30, Dx = -18, Dy = -12 then what is the value of y?

a) $\frac{3}{5}$ b) $\frac{3}{5}$ c) $\frac{2}{5}$ d) $\frac{2}{5}$

4) A pair of linear equations which has a unique solution x = -1, y = -2 is

a) 3x + 2y = 8; 4x + 3y = -5 b) 2x + y = 19; 2x – 3y = -3 c) 2x + 4y = -10; 5x + 3y = -11 d) x + y = 8; x – y = 4

**Q.1) B) Solve the following questions** [04]

1) If 15x + 17y = 21 and 17x + 15y = 11, then find the value of x + y.

2) Find the value of $\begin{vmatrix} -3 & 8 \\ 6 & 0 \end{vmatrix}$



3) For simultaneous equations in variable x and y, if Dx = 25, Dy = 40, D = 5, then what is the value of x?

4) Equations the following in mathematics from using 2 variables x and y. The perimeter of rectangle is 36 cm.

**Q.2) A) Complete any two activities** [04]

1) Solution: D = $\begin{vmatrix} 4 & -2 \\ 4 & 3 \end{vmatrix}$ = □ $D_m = \begin{vmatrix} -4 & -2 \\ 16 & 3 \end{vmatrix}$ = □

$D_n = \begin{vmatrix} 4 & -4 \\ 4 & 16 \end{vmatrix}$ = □ ∴ m = $\frac{D_m}{D}$ = □ and n = $\frac{D_n}{D}$ = □

2) Complete the following activity to solve the simultaneous equations:

5x+3y=9 ---------- (I)

2x-3y=12 ---------- (II)

Let's add equation (I) and (II), we get

| | |
|---|---|
| 5x+3y=9 | Place x = 3 in equation (I) |
| + 2x-3y=12 | 5×□+3y=9 |
| ---------- | ∴3y=9-□=□ |
| □x = □ | y=□/3= □ |
| ∴x= □/□= □ | solution: (x, y) = (3, □) |

3) Solve the following equation: Given

$\frac{1}{x}+\frac{1}{y}=8$ and $\frac{4}{x}-\frac{2}{y}=2$.

Replacing $\frac{1}{x}=m$ and $\frac{1}{y}=n$.

Then the equations □ and

$4m-2n=2$.

Solving, we get $m=3$,

$n=$ □. So $\frac{1}{x}=3$, $\frac{1}{y}=$ □,

therefore $x=\frac{1}{3}$, $y=$□ .

**Q.2) B) Solve any Four sub questions** [08]

1) Solve the following simultaneous equations: 5m – 3n = 19; m – 6n = -7

2) Sum of two numbers is 7 and their difference is 5. Find the numbers.

3) Solve the following simultaneous equation : 2x+3y=7 ; 3x-y=5

4) Solve the following simultaneous equations. x+7y =10 ; 3x - 2y = 7

5) Solve the following simultaneous equations. 3a + 5b = 26 ; a + 5b = 22

**Q.3) A) Complete any One activity** [03]

1) To solve the simultaneous equations by determinant method, fill in the blanks: y + 2x – 19 = 0; 2x – 3y + 3 = 0



Write the given equations in the form $ax+by=c$

$2x+y=19$ ---------- (I)

$2x-3y=-3$ ------- (II)

$D=\begin{vmatrix}\square & \square\\ 2 & -3\end{vmatrix}=[\square\times(-3)]-[2\times(\square)]=\square-\square=\square$

$D_x=\begin{vmatrix}19 & \square\\ \square & -3\end{vmatrix}=[19\times\square]-[\square\times\square]=\square-\square=\square$

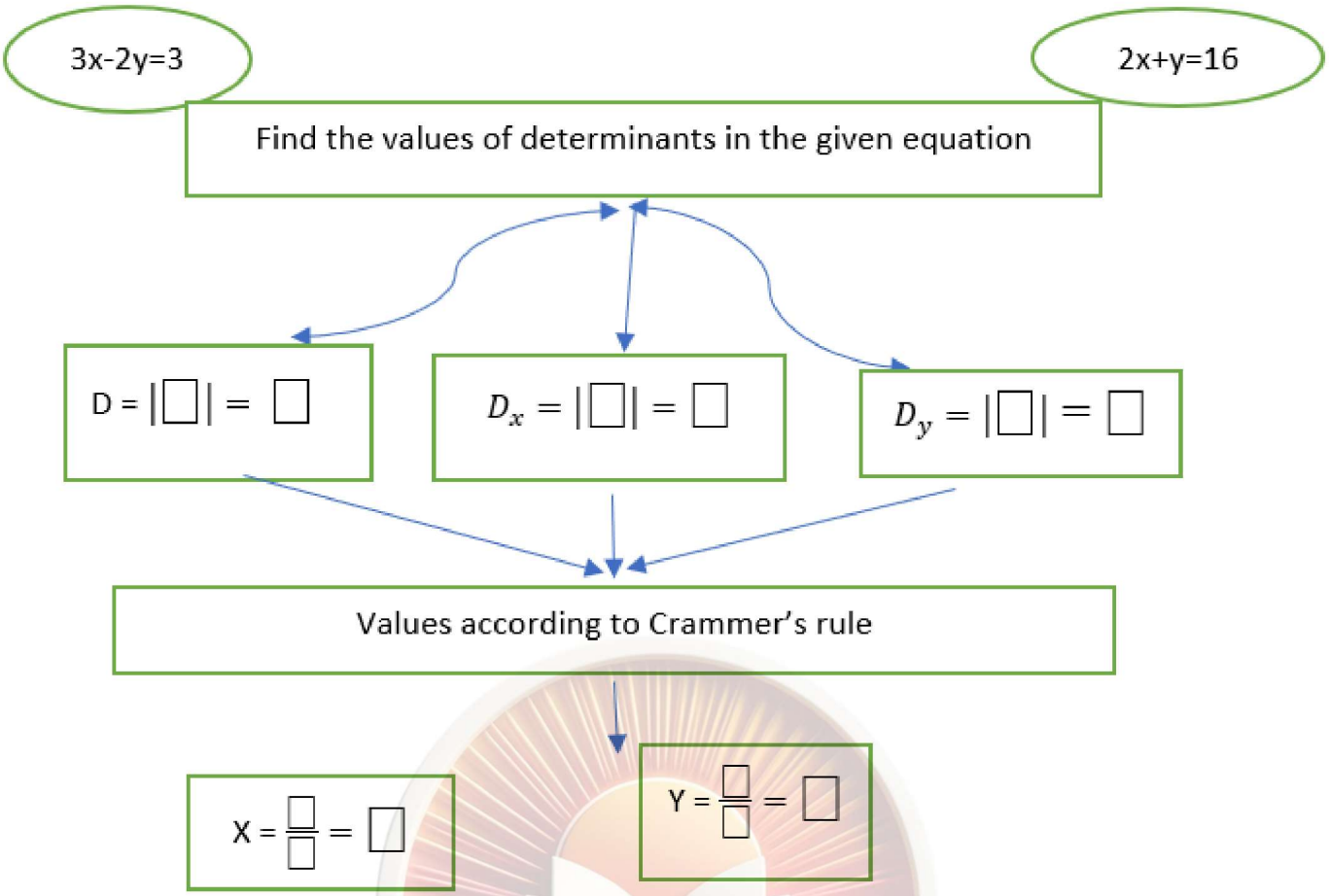
$D_y=\begin{vmatrix}\square & 19\\ 2 & \square\end{vmatrix}=[\square\times\square]-[\square\times\square]=\square-\square=\square$

Crammer's rule –

$x=\frac{D_x}{D}=\frac{\square}{\square}=\square$ | $y=\frac{D_y}{D}=\frac{\square}{\square}=\square$

$\therefore (x,y)=(\square,\square)$ is the solution of the given equation.

2) Complete the following activity –




**Q.3) B) Solve any Two sub questions** [06]

1) Solve the following simultaneous equation: 49x – 57y = 172 ; 57x – 49y = 252

2) Solve the following simultaneous equation by Crammer's rule : 3x – 4y = 10 ; 4x + 3y = 5

3) Solve the following simultaneous equation by Crammer's rule: 6x – 3y = -10 ; 3x + 5y – 8 = 0

4) 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 age.

**Q.4) Solve any Two sub questions** [08]



1) Solve the following simultaneous equation

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

2) Solve the following simultaneous equation

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

3) Kantabai bought $1\frac{1}{2}$ kg tea and 5 kg sugar from a shop. She paid Rs. 50 as return fare for rickshaw. Total expanse was Rs. 700. Then she realized 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 Rs. 880 for that. Find the rate of sugar and tea per kg.

**Q.5) Solve any One sub question** [03]

1) A boat travels 16 km upstream and 24 km downstream in 6 hours. The same boat travels 36 km upstream and 48 km downstream in 13 hours. Find the speed of water current and speed of boat in still water.

2) Solve : $\frac{3x+y}{11} + \frac{5x-y}{5} = 2; \frac{x+4}{3} + \frac{y-1}{4} = 1$