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$$D = \begin{vmatrix} 2 & 3 \\ 2 & -1 \end{vmatrix} = (2\times-1) - (3\times2)$$
$$= -2-6$$
$$= \underline{-8}$$

$$Dx = \begin{vmatrix} 2 & 3 \\ 1 & -1 \end{vmatrix} = (2\times-1) - (3\times1)$$
$$= -2-3$$
$$= -5$$

$$Dy = \begin{vmatrix} 2 & 2 \\ 2 & 1 \end{vmatrix} = (2\times1) - (2\times2)$$
$$= 2-4$$
$$= \underline{-2}$$

क्रेमरच्या नियमानुसार,

$$x = \frac{Dx}{D} = \frac{-5}{-8} \quad \therefore \boxed{x = \frac{5}{8}}$$

$$y = \frac{Dy}{D} = \frac{-2}{-8} \quad \therefore \boxed{x = \frac{1}{4}}$$

⑤ $4m+6n=54$; $3m+2n=28$

$4m+6n=54$

$2m+3n=27 \longrightarrow ①$ [सभी. क्या दोन्ही बाजूस 2 ने भागले]

$3m+2n=28 \longrightarrow ②$

$$D=\begin{vmatrix} 2 & 3 \\ 3 & 2 \end{vmatrix} = (2\times2)-(3\times3)$$
$$= 4-9$$
$$= \underline{\underline{-5}}$$

$$D_m=\begin{vmatrix} 27 & 3 \\ 28 & 2 \end{vmatrix} = (27\times2)-(28\times3)$$
$$= 54-74$$
$$= \underline{\underline{-20}}$$

$$D_n=\begin{vmatrix} 2 & 27 \\ 3 & 28 \end{vmatrix} = (2\times28)-(3\times27)$$
$$= 56-81$$
$$= \underline{\underline{-25}}$$

∴ क्रेमरच्या नियमानुसार

$$m=\frac{D_m}{D}=\frac{-20}{-5}=4 \quad \therefore \boxed{\therefore m=4}$$

$$n=\frac{D_n}{D}=\frac{-25}{-5}=5 \quad \therefore \boxed{\therefore n=5}$$

⑥ $2x+3y=2 \longrightarrow ①$

$$x-\frac{y}{2}=\frac{1}{2}$$

$2\times x-2\times\frac{y}{2}=2\times\frac{1}{2}$ ... [सभी. क्या दोन्ही बाजूस 2 ने गुणले]

$2x-y=1 \longrightarrow ②$

∴ क्रेमरच्या नियमानुसार

$x = \frac{Dx}{D} = \frac{-21}{-7} = 3 \quad \therefore \boxed{x = 3}$

$y = \frac{Dy}{D} = \frac{14}{-7} = -2 \quad \therefore \boxed{y = -2}$

④ $6x - 4y = -12$

$3x - 2y = -6 \longrightarrow ①$ ...(दो. सा. 2 ने भागले)

$8x - 3y = -2 \longrightarrow ②$

$D = \begin{vmatrix} 3 & -2 \\ 8 & -3 \end{vmatrix} = (3 \times 3) - (-2 \times 8)$

$= -9 + 16$

$= \underline{\underline{07}}$

$Dx = \begin{vmatrix} -6 & -2 \\ -2 & -3 \end{vmatrix} = (-6x - 3) - (-2x - 2)$

$= +18 - 4$

$= \underline{\underline{14}}$

$Dy = \begin{vmatrix} 3 & -6 \\ 8 & -2 \end{vmatrix} = (3x - 2) - (-6 \times 8)$

$= -6 + 48$

$= \underline{\underline{42}}$

क्रेमरच्या नियमानुसार

$x = \frac{Dx}{D} = \frac{14}{7} = 2 \quad \therefore \boxed{x = 2}$

$y = \frac{Dy}{D} = \frac{42}{7} = 6 \quad \boxed{y = 6}$

$$D_x = \begin{vmatrix} 4 & 3 \\ 8 & 5 \end{vmatrix} = (4\times5) - (3\times8)$$
$$= 20 - 24$$
$$= \underline{-4}$$

$$D_y = \begin{vmatrix} 4 & 4 \\ 6 & 8 \end{vmatrix} = (4\times8) - (4\times6)$$
$$= 32 - 24$$
$$= \underline{8}$$

∴ क्रेमरच्या नियमानुसार

$$x = \frac{D_x}{D} = \frac{-4}{2} = -2 \quad \therefore \boxed{x = -2}$$

$$y = \frac{D_y}{D} = \frac{8}{2} = 4 \quad \therefore \boxed{y = 4}$$

③ $x + 2y = -1 \longrightarrow ①$

$2x - 3y = 12 \longrightarrow ②$

$$D = \begin{vmatrix} 1 & 2 \\ 2 & -3 \end{vmatrix} = (1\times3) - (2\times2)$$
$$= -3 - 4$$
$$= \underline{-7}$$

$$D_x = \begin{vmatrix} -1 & 2 \\ 12 & -3 \end{vmatrix} = (-1\times-3) - (12\times2)$$
$$= 3 - 24$$
$$= \underline{-21}$$

$$D_y = \begin{vmatrix} 1 & -1 \\ 2 & 12 \end{vmatrix} = (12\times1) - (-1\times2)$$
$$= 12 + 2$$
$$= \underline{14}$$

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प्रश्न 3रा - क्रेमरच्या पद्धतीने सामी सोडवा

① $3x - 4y = 10 \longrightarrow ①$

$4x + 3y = 5 \longrightarrow ②$

$$D = \begin{vmatrix} 3 & -4 \\ 4 & 3 \end{vmatrix} = (3\times3) - (-4\times4)$$

$$= 9 + 16$$

$$= \underline{\underline{25}}$$

$$D_x = \begin{vmatrix} 10 & -4 \\ 5 & 3 \end{vmatrix} = (10\times3) - (-4\times5)$$

$$= 30 + 20$$

$$= \underline{\underline{50}}$$

$$D_y = \begin{vmatrix} 3 & 10 \\ 4 & 5 \end{vmatrix} = (3\times5) - (10\times4)$$

$$= 15 - 40$$

$$= \underline{\underline{-25}}$$

∴ क्रेमरच्या नियमानुसार

$$x = \frac{D_x}{D} = \frac{50}{25} = 2 \quad \therefore \boxed{x = 2}$$

$$y = \frac{D_y}{D} = \frac{-25}{25} = -1 \quad \therefore \boxed{y = -1}$$

② $4x + 3y - 4 = 0$ आणि $6x = 8 - 5y$

∴ $4x + 3y = 4 \longrightarrow ①$

$5x + 5y = 8 \longrightarrow ②$

$$D = \begin{vmatrix} 4 & 3 \\ 6 & 5 \end{vmatrix} = (4\times5) - (3\times6)$$

$$= 20 - 18$$

$$= \underline{\underline{2}}$$

क्रिएटिव मॅथ मराठी
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दोन चलांतील रेषीय समीकरणे
सरावसंच 1.3

1) $\begin{vmatrix} 3 & 2 \\ 4 & 5 \end{vmatrix} = 3 \times \boxed{5} - \boxed{2} \times 4$

$= \boxed{15} - 8$

$= \boxed{7}$

2) खालील निश्चयकांच्या किंमती काढा.

1) $\begin{vmatrix} -1 & 7 \\ 2 & 4 \end{vmatrix} = (-1 \times 4) - (7 \times 2)$

$= -4 - 14$

$= \underline{-18}$

2) $\begin{vmatrix} 5 & 3 \\ -7 & 0 \end{vmatrix} = (5 \times 0) - (3 \times -7)$

$= 0 + 21$

$= \underline{21}$

3) $\begin{vmatrix} \frac{7}{3} & \frac{5}{3} \\ \frac{3}{2} & \frac{1}{2} \end{vmatrix} = \left(\frac{7}{3} \times \frac{1}{2}\right) - \left(\frac{5}{3} \times \frac{3}{2}\right)$

$= \frac{7}{6} - \frac{15}{6}$

$= \frac{-8}{6}$

$= \frac{-4}{3}$