ASSIGNMENT

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DEPARTMENT :-

Q No 01:-

Part 01:-

Sol:-

$$x - 2y = 1$$

$$3x + y = 10$$

$$A = \begin{bmatrix} 1 & -2 \\ 3 & 1 \end{bmatrix}, \quad B = \begin{bmatrix} 1 \\ 10 \end{bmatrix}, \quad X = \begin{bmatrix} x \\ y \end{bmatrix}$$

by Cramer's rules

$$x = \frac{|Ax|}{|A|}, \quad y = \frac{|Ay|}{|A|} \longrightarrow ①$$

$$A_x = \begin{bmatrix} 1 & -2 \\ 10 & 1 \end{bmatrix}$$

$$|A_x| = \begin{bmatrix} 1 & -2 \\ 10 & 1 \end{bmatrix} = 1 \times 1 - 10 \times (-2)$$

$$|Ax| = 1 + 20$$

$$\boxed{|Ax| = 21}$$

$$Ay = \begin{bmatrix} 1 & 1 \\ 3 & 10 \end{bmatrix}$$

$$|Ay| = \begin{bmatrix} 1 & 1 \\ 3 & 10 \end{bmatrix}$$

$$|Ay| = 1 \times 10 - 3 \times 1$$

$$= 10 - 3$$

$$\boxed{|Ay| = 7}$$

$|Ay| = 7$ Put in eq (1)

$$x = \frac{|Ax|}{|A|} \quad , \quad y = \frac{|Ay|}{|A|}$$

$$x = \frac{21}{7} \quad , \quad y = \frac{7}{7}$$

$$\boxed{x = 3} \quad , \quad \boxed{y = 1} \quad \text{Ans.}$$

Q# No 01 :-

Part 02 :-

Sol:

$$x - 3y = 0$$

$$2x + y = 7$$

$$A = \begin{bmatrix} 1 & -3 \\ 2 & 1 \end{bmatrix}, \quad B = \begin{bmatrix} 0 \\ -7 \end{bmatrix}, \quad X = \begin{bmatrix} x \\ y \end{bmatrix}$$

using inversion method

$$x = A^{-1}B \longrightarrow (eq\ 1)$$

Now first find A^{-1}

$$A^{-1} = \frac{1}{|A|}$$

adj of $A \longrightarrow (1)$

$$A = \begin{bmatrix} 1 & -3 \\ 2 & 1 \end{bmatrix}$$

$$|A| = 1 \times 1 - 2 \times (-3)$$

$$|A| = 1 + 6$$

$$\boxed{|A| = 7}$$

$$A = \begin{bmatrix} 1 & -3 \\ 2 & 1 \end{bmatrix}$$

adj of A

④

$$A = \begin{bmatrix} 1 & 3 \\ -2 & 1 \end{bmatrix}$$

Put in eq ①

$$A^{-1} = \frac{1}{|A|} \text{ adj of } A$$

$$A^{-1} = \frac{1}{7} \begin{bmatrix} 1 & 3 \\ -2 & 1 \end{bmatrix}$$

Put in eq

$$X = A^{-1} B$$

$$\begin{bmatrix} x \\ y \end{bmatrix} = \frac{1}{7} \begin{bmatrix} 1 \times 0 + 3 \times (-7) \\ -2 \times 0 + 1 \times (-7) \end{bmatrix}$$

$$\begin{bmatrix} x \\ y \end{bmatrix} = \frac{1}{7} \begin{bmatrix} -21 \\ -7 \end{bmatrix}$$

$$\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -\frac{21}{7} \\ -\frac{7}{7} \end{bmatrix}$$

$$\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -3 \\ 1 \end{bmatrix}$$

$\boxed{x = -3}$, $\boxed{y = 1}$ Ans

Q No 02:-

Part 01:-

$$4y^2 + 15y + 6 = 4y$$

Sol:-

$$4y^2 + 15y + 6 - 4y = 0$$

$$4y^2 + 11y + 6 = 0$$

using factorization method

$$4y^2 + 11y + 6 = 0$$

$$4y^2 + 8y + 3y + 6 = 0$$

$$4y(y+2) + 3(y+2) = 0$$

$$(y+2)(4y+3) = 0$$

$$y+2 = 0, \quad 4y+3 = 0$$

$$y = -2 \qquad \frac{4}{4}y = \frac{-3}{4}$$

$$y = -3/4$$

$$S.S = \{-2, -3/4\} \quad \text{Ans}$$

Q# No 02:-

Part 02:-

$$x^2 + 15x = -50$$

Sol:-

$$x^2 + 15x = -50$$

$$x^2 + 15x + 50 = 0$$

using factorization method

$$x^2 + 15x + 50 = 0$$

$$x^2 + 10x + 5x + 50 = 0$$

$$x(x+10) + 5(x+10) = 0$$

$$(x+10)(x+5) = 0$$

$$x + 10 = 0, \quad x + 5 = 0$$

$$x = -10, \quad x = -5$$

$$S.S = \{-10, -5\} \text{ Ans}$$

R.W

$50x^2$
$10x$
$5x$
$50x$

$10x$
$5x$
$15x$

Q No 02:-

Part 03:-

$y^2 = 6y + 27$

Sol:-

$y^2 = 6y + 27$

$y^2 - 6y - 27 = 0$

using factorization method

$y^2 - 9y + 3y - 27 = 0$

$y(y-9) + 3(y-9) = 0$

$(y-9)(y+3) = 0$

$y-9=0 \quad (y+3) = 0$

$y-9=0 \;,\; y+3=0$

$y = 9 \qquad y = -3$

$S.S = \{9, -3\}$ Ans

R.W

$-27 \times y^2$

$-27y^2$

$-9y \times +3y$

$-27y^2$

$-9y + 3y$

$-6y$

Q No. 03

Ans :- **Part 01 :-**

$$x + 50/x = 27$$

$$x^2 + 50 = 27x$$

$$x^2 - 27x + 50 = 0$$

$$(x-25) = 0 \text{ or } (x-2) = 0$$

$$x = 25 \text{ or } x = 2.$$

Part 02 :-

Ans :

$$x^2 + (x+1)^2 = 5^2$$

$$x^2 + x^2 + 2x + 1 = 25$$

$$-25 \Rightarrow x^2 + x^2 + 2x = 0$$

$$2x^2 + 2x - 24 = 0$$

$$x^2 + x - 12 = 0$$

$$(x-3)(x+4) = 0$$

$$(x+4) = 0 \text{ or } (x-3) = 0$$

$$x = -4 \text{ or } x = 3$$

$x = 3$:

$$\text{Area} = 1/2 \times 3 \times 4 = 6 cm^2$$