Q-1 Mat-125 D-1

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Ans to the Q no. 2

3

Given,

$$A = \begin{bmatrix} 5 & -7 & 1 \\ -7 & 8 & 2 \\ 1 & 2 & -4 \end{bmatrix}$$

$$A^2 = \begin{bmatrix} 5 & -7 & 1 \\ -7 & 8 & 2 \\ 1 & 2 & -4 \end{bmatrix} \begin{bmatrix} 5 & -7 & 1 \\ -7 & 8 & 2 \\ 1 & 2 & -4 \end{bmatrix}$$

$$= \begin{bmatrix} 25+49+1 & -35-56+2 & 5-14-4 \\ -35-56+2 & 49+64+4 & -7+16-8 \\ 5-14-4 & -7+16-8 & 1+4+6 \end{bmatrix}$$

$$= \begin{bmatrix} 75 & -89 & -13 \\ -89 & 117 & 1 \\ -13 & 1 & 21 \end{bmatrix}$$

$$2A = 2\begin{vmatrix} 5 & -7 & 1 \\ -7 & 8 & 2 \\ 1 & 1 & -4 \end{vmatrix}$$

$$= \begin{vmatrix} 10 & -14 & 2 \\ -14 & 16 & 4 \\ 2 & 2 & -8 \end{vmatrix}$$

$$\text{tra}(A^T) \begin{vmatrix} 5 & -7 & 1 \\ -7 & 8 & 1 \\ 1 & 2 & -4 \end{vmatrix}$$

$$\text{tra} = 5 \times 8 \times -4$$

$$= 36$$

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$A^2 + 2A + \text{tra}(A^T)$

$$= \begin{bmatrix} 75 & -89 & -13 \\ -89 & 117 & 1 \\ -13 & 1 & 21 \end{bmatrix} + \begin{bmatrix} 10 & -14 & 2 \\ -14 & 16 & 4 \\ 2 & 2 & 8 \end{bmatrix} + 63$$

$$= \begin{bmatrix} 85 & -103 & -11 \\ -103 & 133 & 5 \\ -11 & 3 & 29 \end{bmatrix} + 36$$

$= 941$

Mat - 125

Quiz - 1 Pg - #4

Ans to the Q no - 1

Given,

$$x_1 + 2x_2 - 3x_3 + 4x_4 = 2$$

$$2x_1 + 5x_2 - 2x_3 + x_4 = 1$$

$$5x_1 + 12x_2 - 7x_3 + 6x_4 = 3$$

Now, Augmented matrix for the eq'n is

$$\left[\begin{array}{cccc|c} 1 & 2 & -3 & 4 & 2 \\ 2 & 5 & -2 & 1 & 1 \\ 5 & 12 & -7 & 6 & 3 \end{array}\right]$$

Now,

$$R_2 = 2R_1 - R_2$$

$$R_3 = 5R_1 - R_3$$

$$\left[\begin{array}{cccc|c} 1 & 2 & -3 & 4 & 2 \\ 2 & 5 & -2 & 1 & 1 \\ & & & & \end{array}\right]$$

$$= \begin{vmatrix} 1 & 2 & -3 & 4 & 2 \\ 0 & -1 & -4 & 7 & 3 \\ 0 & -2 & -8 & 14 & 7 \end{vmatrix}$$

$R_2 = R_1 + R_2$

$R_3 = R_1 + R_3$

$$= \begin{vmatrix} 1 & 2 & -3 & 4 & 2 \\ 0 & 1 & -7 & 11 & 5 \\ 0 & 0 & 5 & 18 & 9 \end{vmatrix}$$

$$=$$