

Name = Abdullah Abid

ID = 16453

Semester = 2nd (SEM)

Section = B

Subject = Linear Algebra -

Name = Abdallah Abid

ID = 16453

Page (1)

Question No (1)

Solution \Rightarrow

ID = 16453

- 2nd = -6

$$A = \begin{vmatrix} 1 & 2 & -6 \\ 2 & 3 & 1 \\ 3 & 1 & 2 \end{vmatrix}$$

As we know that Adjoint A is equal to $\begin{bmatrix} A_{11} & A_{12} & A_{13} \\ A_{21} & A_{22} & A_{23} \\ A_{31} & A_{32} & A_{33} \end{bmatrix}$

Now we find A_{11}, A_{12}, A_{13} & all.

$$A_{11} = \begin{vmatrix} 3 & 1 \\ 1 & 2 \end{vmatrix} = 6 - 1 = 5$$

$$A_{12} = \begin{vmatrix} 2 & 1 \\ 3 & 2 \end{vmatrix} = 4 - 3 = 1$$

$$A_{13} = \begin{vmatrix} 2 & 3 \\ 3 & 1 \end{vmatrix} = 2 - 9 = -7$$

Name = Abdullah Abid

ID = 16453

Page (2)

$$A_{21} = \begin{vmatrix} 2 & -6 \\ 1 & 2 \end{vmatrix} = 4 + 6 = 10$$

$$A_{22} = \begin{vmatrix} 1 & -6 \\ 3 & 2 \end{vmatrix} = 2 + 18 = 20$$

$$A_{23} = \begin{vmatrix} 1 & 2 \\ 3 & 1 \end{vmatrix} = 1 - 6 = -5$$

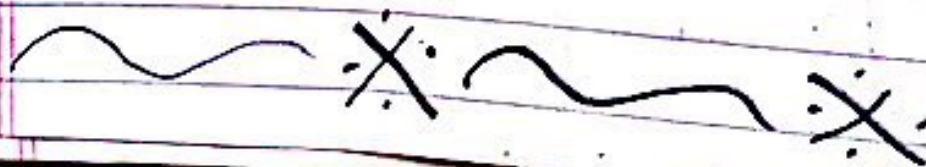
$$A_{31} = \begin{vmatrix} 2 & -6 \\ 3 & 1 \end{vmatrix} = 2 + 18 = 20$$

$$A_{32} = \begin{vmatrix} 1 & -6 \\ 2 & 1 \end{vmatrix} = 1 + 12 = 13$$

$$A_{33} = \begin{vmatrix} 1 & 2 \\ 2 & 3 \end{vmatrix} = 3 - 4 = -1$$

Hence Putting these all values

$$\text{Adj } A = \begin{bmatrix} 5 & 1 & -7 \\ 10 & 20 & -5 \\ 20 & 13 & -1 \end{bmatrix} \quad \text{Ans}$$



Name = Abdullah Abid

ID = 16453

Page (3)

Question No (1)(B)

Solution Part (B)

$$B = \begin{vmatrix} 3 & 4 & 5 \\ 2 & -1 & 8 \\ 5 & -2 & 8 \end{vmatrix} \rightarrow B = \begin{vmatrix} A_{11} & A_{12} & A_{13} \\ A_{21} & A_{22} & A_{23} \\ A_{31} & A_{32} & A_{33} \end{vmatrix}$$

$$B = \begin{vmatrix} + & - & + \\ - & + & - \\ + & - & + \end{vmatrix}$$

$$A_{11} = \begin{vmatrix} -1 & 8 \\ -2 & 8 \end{vmatrix} = -8 + 16 = 8$$

$$A_{12} = \begin{vmatrix} 2 & 8 \\ 5 & 8 \end{vmatrix} = 16 - 40 = -24$$

$$A_{13} = \begin{vmatrix} 2 & 1 \\ 5 & -2 \end{vmatrix} = -4 + 5 = 1$$

NOW

$$A_{21} = \begin{vmatrix} 4 & 5 \\ -2 & 8 \end{vmatrix} = 32 + 10 = 42$$

$$A_{22} = \begin{vmatrix} 3 & 5 \\ 5 & 8 \end{vmatrix} = 24 - 25 = -1$$

Name = Abdullah Abid
ID = 16453

Page (4)

$$A_{23} = \begin{vmatrix} 3 & 4 \\ 5 & -2 \end{vmatrix} = -6 - 20 = -26$$

$$A_{31} = \begin{vmatrix} 4 & 5 \\ -1 & 8 \end{vmatrix} = 32 + 5 = 37$$

$$A_{32} = \begin{vmatrix} 3 & 5 \\ 2 & 8 \end{vmatrix} = 24 - 10 = 14$$

$$A_{33} = \begin{vmatrix} 3 & 4 \\ 2 & -1 \end{vmatrix} = -3 - 8 = -11$$

Now Putting these all values.

$$\text{Adj } A = \begin{bmatrix} 8 & -24 & 1 \\ 42 & -1 & -26 \\ 37 & 14 & -11 \end{bmatrix} \text{ Ans.}$$



Question No(2)

Solution

$$A = \begin{vmatrix} 1 & -2 & 3 \\ -2 & 3 & 1 \\ 4 & 3 & 2 \end{vmatrix}$$

Now first we find cofactor of A_{21}

$$A_{21} = (-1)^{2+1} \begin{vmatrix} -2 & 3 \\ -3 & 2 \end{vmatrix} = (-1)^3 (-4+9) \\ = (-1)(5) \\ = \textcircled{-5}$$

$$A_{31} = (-1)^{3+1} \begin{vmatrix} -2 & 3 \\ 3 & 1 \end{vmatrix}$$

$$= (-1)^4 (-2-9)$$

$$= 1(-11) = \textcircled{-11}$$

$$A_{33} = (-1)^{3+3} \begin{vmatrix} 1 & -2 \\ -2 & 3 \end{vmatrix} = (-1)^9 (3-4) \\ = -1(-1) = \textcircled{1}$$

Name = Abdullah Abid
ID = 16453

page (6)

Hence collector of $A_{21} = -5$

$$A_{31} = -11, A_{33} = 1$$

