

ASSIGNMENT-8

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Download all python codes from

<https://github.com/behappy0604/Summer-Internship-IITH/tree/main/Assignment-8>

and latex-tikz codes from

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3) Now,

$$\begin{aligned}\Delta &= \mathbf{a}_{21}\mathbf{A}_{21} + \mathbf{a}_{22}\mathbf{A}_{22} + \mathbf{a}_{23}\mathbf{A}_{23} \quad (2.0.7) \\ &= 2 \times 7 + 0 \times 7 + 1 \times (-7) = 7\end{aligned}$$

1 QUESTION No. 2.73(B)

Using Cofactors of elements of second row, evaluate $\Delta = \begin{vmatrix} 5 & 3 & 8 \\ 2 & 0 & 1 \\ 1 & 2 & 3 \end{vmatrix}$.

2 SOLUTION

1) We know that $\Delta = \mathbf{a}_{21}\mathbf{A}_{21} + \mathbf{a}_{22}\mathbf{A}_{22} + \mathbf{a}_{23}\mathbf{A}_{23}$
 $a_{21}=2, a_{22}=0, a_{23}=1$.

2) Here we have to calculate cofactors of the second row, i.e. $\mathbf{A}_{21}, \mathbf{A}_{22}, \mathbf{A}_{23}$.

$$\mathbf{M}_{21} = \begin{vmatrix} 3 & 8 \\ 2 & 3 \end{vmatrix} = -7 \quad (2.0.1)$$

$$\mathbf{M}_{22} = \begin{vmatrix} 5 & 8 \\ 1 & 3 \end{vmatrix} = 7 \quad (2.0.2)$$

$$\mathbf{M}_{23} = \begin{vmatrix} 5 & 3 \\ 1 & 2 \end{vmatrix} = 7 \quad (2.0.3)$$

- Cofactor of \mathbf{a}_{21} is:

$$\mathbf{A}_{21} = (-1)^{2+1}\mathbf{M}_{21} = (-1)^3 \times -7 = 7 \quad (2.0.4)$$

- Cofactor of \mathbf{a}_{22} is:

$$\mathbf{A}_{22} = (-1)^{2+2}\mathbf{M}_{22} = (-1)^4 \times 7 = 7 \quad (2.0.5)$$

- Cofactor of \mathbf{a}_{23} is:

$$\mathbf{A}_{23} = (-1)^{2+3}\mathbf{M}_{23} = (-1)^5 \times 7 = -7 \quad (2.0.6)$$