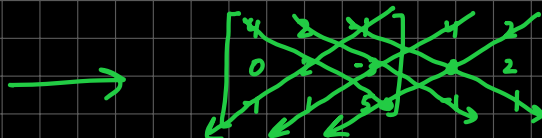


- $\det(A) = \det(A^T)$; A is square matrix, and below
- $\det(B) = k \det(A)$; when B results from multiplication of k with A
- $\det(B) = -\det(A)$; row interchanged
- other operations $\det(A) = \det(B)$
- If kE , then $\det(E) = k$
↳ for only one row
- A, having 2 proportional rows/columns has $\det(A) = 0$
- For Row reduction, follow det rules

• Take out common instead of multiplying

Q4- $A = \begin{bmatrix} 4 & 2 & -1 \\ 0 & 2 & -3 \\ -1 & 1 & 5 \end{bmatrix}$



$$|A| = 4 \begin{vmatrix} 2 & -3 \\ 1 & 5 \end{vmatrix} + (-1) \begin{vmatrix} 2 & -1 \\ 2 & -3 \end{vmatrix}$$

$$= (40 + 6) - (2 - 12)$$

$$= 46 + 10 = \underline{\underline{56}}$$

$$= 4(13) + 4$$

$$= 52 + 4 = \underline{\underline{56}}$$

$$A^T = \begin{bmatrix} 4 & 0 & -1 \\ 2 & 2 & 1 \\ -1 & -3 & 5 \end{bmatrix}$$

$$|A^T| = 4 \begin{vmatrix} 2 & 1 \\ -3 & 5 \end{vmatrix} - 1 \begin{vmatrix} 2 & 2 \\ -1 & -3 \end{vmatrix}$$

$$= 52 + 4 = \underline{\underline{56}}$$

Q7- $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

$$|A| = \begin{vmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

$$= -1 \begin{vmatrix} 1 & 0 \\ 0 & 1 \end{vmatrix} = -1$$

Q23- $\begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{vmatrix} = (b-a)(c-a)(c-b)$

$$= \begin{vmatrix} 1 & 1 & 1 \\ 0 & b-a & c-a \\ a^2 & b^2 & c^2 \end{vmatrix}$$

$$= \begin{vmatrix} 1 & 1 & 1 \\ 0 & b-a & c-a \\ 0 & b^2-a^2 & c^2-a^2 \end{vmatrix}$$

$$= \begin{vmatrix} 1 & 1 & 1 \\ 0 & b-a & c-a \\ 0 & 0 & c^2-a^2-b^2+a^2 \end{vmatrix}$$

$$= (c^2-b^2) \begin{vmatrix} 1 & 1 & 1 \\ 0 & b-a & c-a \\ 0 & 0 & 1 \end{vmatrix}$$

$$= (c^2-b^2) \cdot \begin{vmatrix} 1 & 1 \\ 0 & b-a \end{vmatrix}$$

$$= c^2-b^2 (b-a)$$

$$= (b-a)(c-b)(c+b)$$