Key Takeaways

Properties of determinant

- If elements of a row (or column) are multiplied by a constant, then value of determinant also gets multiplied by the same constant .

Proof:

$$\Delta_1 = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix} \qquad \Delta_2 = \begin{vmatrix} ka_{11} & a_{12} & a_{13} \\ ka_{21} & a_{22} & a_{23} \\ ka_{31} & a_{32} & a_{33} \end{vmatrix}$$

$$\Delta_2 = k\,\Delta_1$$

$$\Delta_2 = k \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$$

$$\Delta_1 = a_{11}M_{11} - a_{21}M_{21} + a_{31}M_{31}$$

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