# Key Takeaways

## Properties of Determinants

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The value of determinant is not altered by adding to the elements of any row ( or column ) a constant multiple of corresponding elements of any other row ( or column ) .

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

$R_1 \to R_1 + pR_2$ , where $p$ is a scalar.

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

$$\boxed{\Delta_1 = \Delta_2}$$

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