

Determinants - Class XII

Related Questions with Solutions

Questions

Question: 01

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

- A. $(a+b+c)^3$
B. $(a+b+c)^2$
C. $(a-b+c)^2$
D. $(a-b+c)^3$

Solutions

Solution: 01

$$\begin{aligned} &= \begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix} \quad R_1 \Rightarrow R_1 + R_2 + R_3 \\ &= (a+b+c) \begin{vmatrix} 1 & 1 & 1 \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix} \quad \left[\begin{array}{l} C_2 \rightarrow C_2 - C_1 \\ C_3 \rightarrow C_3 - C_1 \end{array} \right] \\ &= (a+b+c) \begin{vmatrix} 1 & 0 & 0 \\ 2b & -a-b-c & 0 \\ 2c & 0 & -a-b-c \end{vmatrix} \\ &= (a+b+c) \begin{vmatrix} -b-c-a & 0 \\ 0 & -c-a-b \end{vmatrix} \quad [\text{expanding along } C_1] \\ &= (a+b+c)(a+b+c)^2 = (a+b+c)^3 \end{aligned}$$

Correct Options

Answer:01

Correct Options: A