Let a, b, c be such that $b(c+a) \neq 0$. If

$$\begin{vmatrix} a & a+1 & a-1 \\ -b & b+1 & b-1 \\ c & c-1 & c+1 \end{vmatrix} + \begin{vmatrix} a+1 & b+1 & c-1 \\ a-1 & b-1 & c+1 \\ (-1)^{n+2}a & (-1)^{n+1}b & (-1)^{n}c \end{vmatrix} = 0$$. Then the value of n is :

A. Zero

B. Any even integer

C. Any odd integer

D. Any integer

Solution:

$$\underbrace{\begin{vmatrix} a & a+1 & a-1 \\ -b & b+1 & b-1 \\ c & c-1 & c+1 \end{vmatrix}}_{\Delta_1} + \underbrace{\begin{vmatrix} (-1)^{n+2}a & a+1 & a-1 \\ (-1)^{n+1}b & b+1 & b-1 \\ (-1)^{n}c & c-1 & c+1 \end{vmatrix}}_{\Delta_2} = 0$$

$$\Delta_2 = \begin{vmatrix} (-1)^{n+2}a & (-1)^{n+1}b & (-1)^{n}c \\ a+1 & b+1 & c-1 \\ a-1 & b-1 & c+1 \end{vmatrix} = \begin{vmatrix} (-1)^{n+2}a & a+1 & a-1 \\ (-1)^{n+1}b & b+1 & b-1 \\ (-1)^{n}c & c-1 & c+1 \end{vmatrix}$$

$$\Delta_1 + \Delta_2 = 0$$

n is odd integer

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