

Q.10

Let a, b, c, d in arithmetic progression with common difference λ . If
$$\begin{vmatrix} x+a-c & x+b & x+a \\ x-1 & x+c & x+b \\ x-b+d & x+d & x+c \end{vmatrix} = 2$$
, then value of λ^2 is equal to _____.

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

$$C_2 \rightarrow C_2 - C_3$$

$$\Rightarrow \begin{vmatrix} x - 2\lambda & \lambda & x + a \\ x - 1 & \lambda & x + b \\ x + 2\lambda & \lambda & x + c \end{vmatrix} = 2$$

$$R_2 \rightarrow R_2 - R_1, R_3 \rightarrow R_3 - R_1$$

$$\Rightarrow \begin{vmatrix} x - 2\lambda & 1 & x + a \\ 2\lambda - 1 & 0 & \lambda \\ 4\lambda & 0 & 2\lambda \end{vmatrix} = 2$$

$$\Rightarrow 1(4\lambda^2 - 4\lambda^2 + 2\lambda) = 2$$

$$\Rightarrow \lambda^2 = 1$$