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Assignment for 12/(C+D)

Maths

Q.→1 Find the area of the triangle with vertices (3, 8), (−4, 2) and (5, −1)

Q.→2 Show that the points A(a, b+c), B(b, c+a), C(c, a+b) are collinear.

Q.→3 Evaluate the value of determinant

$$\Delta = \begin{vmatrix} 1 & \sin x & 1 \\ -\sin x & 1 & \sin x \\ -1 & -\sin x & 1 \end{vmatrix}$$

Also show that $2 \leq \Delta \leq 4$

Q.→4 Prove that the determinant

$$\begin{vmatrix} a & \sin x & \cos x \\ -\sin x & -a & 1 \\ \cos x & 1 & a \end{vmatrix}$$

is independent of x.

Q.→5 Without expanding, prove that

$$\begin{vmatrix} (x^a + x^{-a})^2 & (x^a - x^{-a})^2 & 1 \\ (x^b + x^{-b})^2 & (x^b - x^{-b})^2 & 1 \\ (x^c + x^{-c})^2 & (x^c - x^{-c})^2 & 1 \end{vmatrix} = 0$$

where $x, a, b > 0$

12 (C+D)

Q:→6 using properties of determinant prove that

$$\begin{vmatrix} b+c & a-b & a \\ c+a & b-c & b \\ a+b & c-a & c \end{vmatrix} = 3abc - a^3 - b^3 - c^3$$

Q:→7 Evaluate

$$\begin{vmatrix} (x+1) & (x+2) & x+2 \\ (x+2) & (x+3) & x+3 \\ (x+3) & (x+4) & x+4 \end{vmatrix}$$

Q:→8 solve the equation

$$\begin{vmatrix} 3x-8 & 3 & 3 \\ 3 & 3x-8 & 3 \\ 3 & 3 & 3x-8 \end{vmatrix} = 0$$

Dilip Kumar Singh
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