2017-18

MODERN PUBLIC SCHOOL SECTOR-37 FBD

Topic Date

SUMMER HOLIDAY HOME WORK

CLASS - XII

SUBJECT - MATHS

Q1 If $\sin^{-1}x + \sin^{-1}y + \sin^{-1}z = \pi$ then prove that
$x\sqrt{1-x^2} + y\sqrt{1-y^2} + z\sqrt{1-z^2} = 2xyz$

Q2 Prove that $\tan\left(\frac{\pi}{4} + \frac{1}{2}\cos^{-1}\frac{a}{b}\right) + \tan\left(\frac{\pi}{4} - \frac{1}{2}\cos^{-1}\frac{a}{b}\right) = \frac{2b}{a}$

Q3 If $y = \cot^{-1}(\sqrt{\cos x}) - \tan^{-1}(\sqrt{\cos x})$ then prove that
$\sin y = \tan^2\left(\frac{x}{2}\right)$

Q4 By using properties of determinant, Prove the following

$$\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix} = (a+b+c)^3$$

Q5 Show that $\begin{vmatrix} x+1 & x+2 & x+a \\ x+2 & x+3 & x+b \\ x+3 & x+4 & x+c \end{vmatrix} = 0$ where a, b, c are in A.P.

Q6 Using property of determinant, prove the following

$$\begin{vmatrix} a & a+b & a+2b \\ a+2b & a & a+b \\ a+b & a+2b & a \end{vmatrix} = 9b^2(a+b)$$

Q7 If $\begin{vmatrix} 3x & 7 \\ 2 & 4 \end{vmatrix} = 10$ then find the value of x

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Q8 If a, b, c are positive and unequal, then show that the following determinant is negative

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

Q9 Show that the function $f(x) = 2x - |x|$ is continuous but not differentiable at $x = 0$

Q10 Find the value of k, for which

$$f(x) = \begin{cases} \dfrac{\sqrt{1+kx} - \sqrt{1-kx}}{x} & \text{if } -1 \le x < 0 \\ \dfrac{2x+1}{x-1} & \text{if } 0 \le x < 1 \end{cases}$$

is continuous at $x = 0$

Q11 If $x^y = e^{x-y}$, then show that $\dfrac{dy}{dx} = \dfrac{\log x}{[\log(xe)]^2}$

Q12 Find the derivative of y with respect to x, where $y = x^{\sin x} + (\sin x)^x$

Q13 Differentiate $\tan^{-1}\dfrac{x}{\sqrt{1-x^2}}$ with respect to $\sin^{-1}(2x\sqrt{1-x^2})$

Q14 If $x^{13} y^7 = (x+y)^{20}$, then prove that $\dfrac{dy}{dx} = \dfrac{y}{x}$

Q15 Verify Lagrange's mean value theorem for the function $f(x) = x^2 + 2x + 3$, for $[4, 6]$

Note - 1. Revise your full syllabus done in your class

2. Holiday Home work will be checked on 3rd, 4th and 5th July