MATHS

BOOKS - KC SINHA ENGLISH

TRIGONOMTERY - PREVIOUS YEAR QUESTIONS - FOR COMPETITION

Exercise

1. The value of

$$6+\log_{3/2}\left(\frac{1}{3\sqrt{2}}\sqrt{4-\frac{1}{3\sqrt{2}}\sqrt{4-\frac{1}{3\sqrt{2}}\sqrt{4-\frac{1}{3\sqrt{2}}\ldots}}}\right)$$ is _____.

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2. Let PQR be a triangle of area Δ with $a = 2, b = 7/2$, and $c = 5/2$, where a, b and c are the lengths of the sides of the triangle opposite to the angles at P, Q and R, respectively. Then $\frac{2\sin P - \sin 2P}{2\sin P + \sin 2P}$ equals

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3. Let $f:(-1,1)\overrightarrow{R}$ be such that $f(\cos 4\theta) = \frac{2}{2 - \sec^2\theta}$ for $\theta \in \left(0, \frac{\pi}{4}\right) \cup \left(\frac{\pi}{4}, \frac{\pi}{2}\right)$. Then the value(s) of $f\left(\frac{1}{3}\right)$ is (are) $1 - \sqrt{\frac{3}{2}}$ (b) $1 + \sqrt{\frac{3}{2}}$ (c) $1 - \sqrt{\frac{2}{3}}$ (d) $1 + \sqrt{\frac{2}{3}}$

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4. Prove that $\tan 9^\circ - \tan 27^\circ - \tan 63^\circ + \tan 81^\circ = 4$

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5. The equation $e^{\sin x} - e^{-\sin x} - 4 = 0$ has

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6. In a ΔPQR , if $3\sin P + 4\cos Q = 6$ and $4\sin Q + 3\cos P = 1$, then the angle R is equal to (1) $\frac{5\pi}{6}$ (2) $\frac{\pi}{6}$ (3) $\frac{\pi}{4}$ (4) $\frac{3\pi}{4}$

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7. ABCD is a trapezium such that AB and CD are parallel and $BC \perp CD$. If $\angle ADB = \theta$, $BC = p$ and $CD = q$, then AB is equal to

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8. If x, y, z are in A.P. and $tan^{-1}x, tan^{-1}y$ and $tan^{-1}z$ are also in A.P., then (1) $2x = 3y = 6z$ (2) $6x = 3y = 2z$ (3) $6x = 4y = 3z$ (4) $x = y = z$

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9. Prove that : $\frac{\tan A}{1-\cot A}+\frac{\cot A}{1-\tan A}=1+\sec A.\operatorname{cosec} A$

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10. If

$S=\tan^{-1}\left(\frac{1}{n^2+n+1}\right)+\tan^{-1}\left(\frac{1}{n^2+3n+3}\right)+\ldots+\tan^{-1}\left(\frac{}{1+(}\right.$

then tan S is equal to

$(A)\frac{20}{401+20n}(B)\frac{n}{n^2+20n+1}(C)n(401+20n)(D)\frac{20}{n^2+n-1}$

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11. The number of solution of the equation

$\sin 2\theta-2\theta\pi+4\sin\theta\pi=4\in[0,5\pi]$ is equal to 3 (b) 4 (c) 5 (d) 6

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12. The value of $\cot\left(\sum_{n=1}^{23}\cot^{-1}\left(1+\sum_{k=1}^{n}2k\right)\right)$ is (a) $\frac{23}{25}$ (b) $\frac{25}{23}$ (c) $\frac{23}{24}$ (d) $\frac{25}{26}$

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13. The number of points in $[-\infty,\infty)$ for which $x^2-x\sin x-\cos x=0$ is

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14. about to only mathematics

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15. If $3^x=4^{x-1}$, then $x=$ $\frac{2(\log)_3 2}{2(\log)_3 2-1}$ (b) $\frac{2}{2-(\log)_2 3}$ $\frac{1}{1-(\log)_4 3}$ (d) $\frac{2(\log)_2 3}{2(\log)_2 3-1}$

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