MATHS

BOOKS - JEE MAINS PREVIOUS YEAR

ENGLISH

TRIGONOMETRIC FUNCTIONS

Others

1. A tower stands at the centre of a circular park. A and B are two points on the boundary

of the park such that $AB(=a)$ subtends an angle of 60° at the foot of the tower, and the angle of elevation of the top of the tower from A or B is 30° . The height of the tower is (1) $\frac{2a}{\sqrt{3}}$ (2) $2a\sqrt{3}$ (3) $\frac{a}{\sqrt{3}}$ (4) $a\sqrt{3}$

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2. AB is a vertical pole with B at the ground level and A at the top. A man finds that the angle of elevation of the point A from a certain point C on the ground is $60o$. He

moves away from the pole along the line BC to a point D such that $CD = 7m$. From D the angle of elevation of the point A is $45o$. Then the height of the pole is (1) $\frac{7\sqrt{3}}{2}\frac{1}{\sqrt{3}-1}m$ (2) $\frac{7\sqrt{3}}{2}\sqrt{3}+1m$ (3) $\frac{7\sqrt{3}}{2}\sqrt{3}-1m$ (4) $\frac{7\sqrt{3}}{2}\sqrt{3}+1m$

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3. Let A and B denote the statements A: $\cos a+\cos b+\cos g=0$ B : $\sin a+\sin b+\sin g=0$ If

$\cos(bg) + \cos(ga) + \cos(ab) = 3/2$, then (1) A is true and B is false (2) A is false and B is true (3) both A and B are true (4) both A and B are false

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4. $\int_0^{\pi} [\cot x] dx$, where [.] denotes the greatest integer function, is equal to (1) $\pi/2$ (2) 1 (3) 1 (4) $\pi/2$

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5. For a regular polygon, let r and R be the radii of the inscribed and the circumscribed circles. A false statement among the following is There is a regular polygon with $\frac{r}{R}=\frac{1}{\sqrt{2}}$ (17) There is a regular polygon with $\frac{r}{R}=\frac{2}{3}$ (30) There is a regular polygon with $\frac{r}{R}=\frac{\sqrt{3}}{2}$ (47) There is a regular polygon with $\frac{r}{R}=\frac{1}{2}$ (60)

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6. Let $\cos(\alpha+\beta)=\frac{4}{5}$ and let $\sin(\alpha-\beta)=\frac{5}{13}$ where $0\leq\alpha,\beta\leq\frac{\pi}{4}$, then $tan2\alpha=$ (1) $\frac{56}{33}$ (2) $\frac{19}{12}$ (3) $\frac{20}{7}$ (4) $\frac{25}{16}$

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7. If $A=\sin^2 x+\cos^4 x$, then for all real x :

(1) $\frac{3}{4}\leq A\leq 1$ (2) $\frac{13}{16}\leq A\leq 1$ (3) $1\leq A\leq 2$ (4) $\frac{3}{4}\leq A\leq\frac{13}{16}$

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8. 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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9. no.of solutions of the equation $e^{\sin x} - e^{-\sin x} - 4 = 0$

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10. The expression $\frac{\tan A}{1-\cot A}+\frac{\cot A}{1-\tan A}$ can be written as (1) $secA\cos ecA+1$ (2) $tanA+\cot A$ (3) $secA+\cos ecA$ (4) $s\in A\cos A+1$

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11. Let a vertical tower AB have its end A on the level ground. Let C be the mid point of AB and P be a point on the ground such that

$AP = 2AB$. If $\angle BPC = \beta$, then $\tan\beta$ is equal to : (1) $\frac{2}{9}$ (2) $\frac{4}{9}$ (3) $\frac{6}{7}$ (4) $\frac{1}{4}$

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