

Topic :- TRIGONOMETRIC FUNCTIONS

1. If $\alpha, \beta \in (0, \frac{\pi}{2})$, $\sin \alpha = \frac{4}{5}$ and $\cos(\alpha + \beta) = -\frac{12}{13}$, then $\sin \beta$ is equal to
 a) $\frac{63}{65}$ b) $\frac{61}{65}$ c) $\frac{3}{5}$ d) $\frac{5}{13}$
2. The value of $\sin \frac{\pi}{14} \sin \frac{3\pi}{14} \sin \frac{5\pi}{14} \sin \frac{7\pi}{14}$, is
 a) 1 b) $1/4$ c) $1/8$ d) $\sqrt{2}/7$
3. If $\theta_1, \theta_2, \theta_3, \theta_4$ are roots of the equation $\sin(\theta + \alpha) = k \sin 2\theta$ no two of which differ by a multiple of 2π , then $\theta_1 + \theta_2 + \theta_3 + \theta_4$ is equal to
 a) $2n\pi, n \in Z$ b) $(2n + 1)\pi, n \in Z$ c) $n\pi, n \in Z$ d) None of these
4. The radius of the circle whose arc of length 15π cm makes an angle of $\frac{3\pi}{4}$ radian at the centre is
 a) 10 cm b) 20 cm c) $11\frac{1}{4}$ cm d) $22\frac{1}{2}$ cm
5. The value of $\cot \theta - \tan \theta - 2 \tan 2\theta - 4 \tan 4\theta - 8 \cot 8\theta$, is
 a) 0 b) 1 c) -1 d) None of these
6. In a triangle ABC , $b = \sqrt{3}$, $c = 1$ and $\angle A = 30^\circ$, then the measure of the largest angle of the triangle is
 a) 60° b) 135° c) 90° d) 120°
7. The maximum value of $3\cos \theta + 4 \sin \theta$ is
 a) 3 b) 4 c) 5 d) None of these
8. If the sides of a triangle are proportional to $2, \sqrt{6}$ and $\sqrt{3} - 1$, the greatest and the least angles of the triangle are
 a) $120^\circ, 15^\circ$ b) $90^\circ, 15^\circ$ c) $75^\circ, 45^\circ$ d) $150^\circ, 15^\circ$
9. In a ΔABC if $r_1 = 16, r_2 = 48$ and $r_3 = 24$, then its in-radius is
 a) 7 b) 8 c) 6 d) None of these
10. The number of values of x in the interval $[0, 5\pi]$ satisfying the equation $3 \sin^2 x - 7 \sin x + 2 = 0$ is
 a) 0 b) 5 c) 6 d) 10
11. If $\cos^2 \theta = \cos 2\theta$, then the general value of θ is
 a) $n\pi$ b) $2n\pi$ c) $\frac{n\pi}{3}$ d) $\frac{n\pi}{2}$
12. The equation $3^{\sin 2x + 2 \cos^2 x} + 3^{1 - \sin 2x + 2 \sin^2 x} = 28$ is satisfied for the values of x given by
 a) $\cos x = 0, \tan x = -1$ b) $\tan x = -1, \cos x = 1$ c) $\tan x = 1, \cos x = 0$ d) None of these
13. The minimum value of $27^{\cos 2x} 81^{\sin 2x}$ is
 a) -5 b) $\frac{1}{5}$ c) $\frac{1}{243}$ d) $\frac{1}{27}$
14. Let $0 < x \leq \pi/4$, then $(\sec 2x - \tan 2x)$ equals
 a) $\tan^2(x + \pi/4)$ b) $\tan(x + \pi/4)$ c) $\tan(\pi/4 - x)$ d) $\tan(x - \pi/4)$

15. The number of solutions of the equation $\sin^5 x - \cos^5 x = \frac{1}{\cos x} - \frac{1}{\sin x}$ ($\sin x \neq \cos x$) is
 a) 0 b) 1 c) Infinite d) None of these
16. 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 $\tan 2\alpha$ is equal to
 a) $\frac{25}{16}$ b) $\frac{56}{33}$ c) $\frac{19}{12}$ d) $\frac{20}{7}$
17. The value of $\cos \frac{2\pi}{7} + \cos \frac{4\pi}{7} + \cos \frac{6\pi}{7}$, is
 a) 1 b) -1 c) 1/2 d) -1/2
18. If in a triangle $a \cos^2 \left(\frac{C}{2}\right) + c \cos^2 \left(\frac{A}{2}\right) = \frac{3b}{2}$, then the sides of the triangle are in
 a) AP b) GP c) HP d) None of these
19. If $\frac{1 - \cos 2\theta}{1 + \cos 2\theta} = 3$, then the general value of θ is
 a) $2n\pi \pm \frac{\pi}{6}$ b) $n\pi \pm \frac{\pi}{6}$ c) $2n\pi \pm \frac{\pi}{3}$ d) $n\pi \pm \frac{\pi}{3}$
20. In a ΔABC , if $a = 5$ cm, $b = 4$ cm and $\cos(A - B) = \frac{31}{32}$, then $\cos C =$
 a) 1/4 b) 1/8 c) 1/6 d) 1/2

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