TRIGONOMETRY - (TEST - 5)

1. The value of $\cos 15^\circ - \sin 15^\circ$ is equal to

   (a) $\frac{1}{\sqrt{2}}$ (b) $\frac{1}{2}$ (c) $-\frac{1}{\sqrt{2}}$ (d) 0

2. If $\tan\alpha, \tan\beta$ are the roots of the equation $x^2 + px + q = 0 \ (p \neq 0)$, then

   (a) $\sin^2(\alpha+\beta) + p\sin(\alpha+\beta)\cos(\alpha+\beta) + q\cos^2(\alpha+\beta) = q$

   (b) $\tan(\alpha+\beta) = \frac{p}{q-1}$

   (c) $\cos(\alpha+\beta) = 1-q$

   (d) $\sin(\alpha+\beta) = -p$

3. $\tan 5x \tan 3x \tan 2x =$

   (a) $\tan 5x - \tan 3x - \tan 2x$ (b) $\frac{\sin 5x - \sin 3x - \sin 2x}{\cos 5x - \cos 3x - \cos 2x}$

   (c) 0 (d) None of these

4. If $\tan\alpha$ equals the integral solution of the inequality $4x^2 - 16x + 15 < 0$ and $\cos\beta$ equals to the slope of the bisector of first quadrant, then $\sin(\alpha+\beta)\sin(\alpha-\beta)$ is equal to

   (a) $\frac{3}{5}$ (b) $-\frac{3}{5}$ (c) $\frac{2}{\sqrt{5}}$ (d) $\frac{4}{5}$

5. $\tan\frac{2\pi}{5} - \tan\frac{\pi}{15} - \sqrt{3}\tan\frac{2\pi}{5}\tan\frac{\pi}{15}$ is equal to

   (a) $-\sqrt{3}$ (b) $\frac{1}{\sqrt{3}}$ (c) 1 (d) $\sqrt{3}$

6. The value of $\cos 12^\circ + \cos 84^\circ + \cos 156^\circ + \cos 132^\circ$ is

   (a) $\frac{1}{2}$ (b) 1 (c) $-\frac{1}{2}$ (d) $\frac{1}{8}$

7. The value of $\cos 52^\circ + \cos 68^\circ + \cos 172^\circ$ is

   (a) 0 (b) 1 (c) 2 (d) $\frac{3}{2}$

8. $\frac{\cos 17^\circ + \sin 17^\circ}{\cos 17^\circ - \sin 17^\circ} =$

   (a) $\tan 62^\circ$ (b) $\tan 56^\circ$ (c) $\tan 54^\circ$ (d) $\tan 73^\circ$

9. $\frac{\cos 9^\circ + \sin 9^\circ}{\cos 9^\circ - \sin 9^\circ} =$

   (a) $\tan 54^\circ$ (b) $\tan 36^\circ$ (c) $\tan 18^\circ$ (d) None

10. $\frac{\sin 70^\circ + \cos 40^\circ}{\cos 70^\circ + \sin 40^\circ} =$

    (a) 1 (b) $\frac{1}{\sqrt{3}}$ (c) $\sqrt{3}$ (d) $\frac{1}{2}$

11. If $\cos(A-B) = \frac{3}{5}$ and $\tan A \tan B = 2$, then

    (a) $\cos A \cos B = \frac{1}{5}$ (b) $\sin A \sin B = -\frac{2}{5}$

    (c) $\cos A \cos B = -\frac{1}{5}$ (d) $\sin A \sin B = -\frac{1}{5}$

12. $\tan 100^\circ + \tan 125^\circ + \tan 100^\circ \tan 125^\circ =$

    (a) 0 (b) 1/2 (c) -1 (d) 1

13. If $\frac{\pi}{2} < \alpha < \pi,\ \pi < \beta < \frac{3\pi}{2};\ \sin\alpha = \frac{15}{17}$ and $\tan\beta = \frac{12}{5}$, then the value of $\sin(\beta - \alpha)$ is

(a) $-171/221$ (b) $-21/221$ (c) $21/221$ (d) $171/221$

14. If $\cos x + \cos y + \cos\alpha = 0$ and $\sin x + \sin y + \sin\alpha = 0$, then $\cot\left(\frac{x+y}{2}\right) =$

(a) $\sin\alpha$ (b) $\cos\alpha$ (c) $\cot\alpha$ (d) $\sin\left(\frac{x+y}{2}\right)$

15. If $\sin\theta + \sin 2\theta + \sin 3\theta = \sin\alpha$ and $\cos\theta + \cos 2\theta + \cos 3\theta = \cos\alpha$, then θ is equal to

(a) $\alpha/2$ (b) α (c) 2α (d) $\alpha/6$

16. $\frac{\cos 10^o + \sin 10^o}{\cos 10^o - \sin 10^o} =$

(a) $\tan 55^o$ (b) $\cot 55^o$ (c) $-\tan 35^o$ (d) $-\cot 35^o$

17. If $\cos P = \frac{1}{7}$ and $\cos Q = \frac{13}{14}$, where P and Q both are acute angles. Then the value of $P - Q$ is

(a) 30^o (b) 60^o (c) 45^o (d) 75^o

18. $\sec 50^o + \tan 50^o$ is equal to

(a) $\tan 20^o + \tan 50^o$ (b) $2\tan 20^o + \tan 50^o$

(c) $\tan 20^o + 2\tan 50^o$ (d) $2\tan 20^o + 2\tan 50^o$

19. If $\tan\alpha = (1 + 2^{-x})^{-1},\ \tan\beta = (1 + 2^{x+1})^{-1}$, then $\alpha + \beta$ equals

(a) $\pi/6$ (b) $\pi/4$ (c) $\pi/3$ (d) $\pi/2$

13. If $\frac{\pi}{2} < \alpha < \pi,\ \pi < \beta < \frac{3\pi}{2};\ \sin\alpha = \frac{15}{17}$ and $\tan\beta = \frac{12}{5}$, then the value of $\sin(\beta - \alpha)$ is

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16. $\frac{\cos 10^o + \sin 10^o}{\cos 10^o - \sin 10^o} =$

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19. If $\tan\alpha = (1 + 2^{-x})^{-1},\ \tan\beta = (1 + 2^{x+1})^{-1}$, then $\alpha + \beta$ equals

(a) $\pi/6$ (b) $\pi/4$ (c) $\pi/3$ (d) $\pi/2$

20. The sum $S = \sin\theta + \sin 2\theta + ... + \sin n\theta$, equals

(a) $\sin\frac{1}{2}(n+1)\theta \sin\frac{1}{2}n\theta / \sin\frac{\theta}{2}$

(b) $\cos\frac{1}{2}(n+1)\theta \sin\frac{1}{2}n\theta / \sin\frac{\theta}{2}$

(c) $\sin\frac{1}{2}(n+1)\theta \cos\frac{1}{2}n\theta / \sin\frac{\theta}{2}$

(d) $\cos\frac{1}{2}(n+1)\theta \cos\frac{1}{2}n\theta / \sin\frac{\theta}{2}$

21. The value of $\cot 70^o + 4\cos 70^o$ is

(a) $\frac{1}{\sqrt{3}}$ (b) $\sqrt{3}$ (c) $2\sqrt{3}$ (d) $\frac{1}{2}$

22. The expression $2\cos\frac{\pi}{13}.\cos\frac{9\pi}{13} + \cos\frac{3\pi}{13} + \cos\frac{5\pi}{13}$ is equal to

(a) -1 (b) 0 (c) 1 (d) None

23. If $\sin\theta = \frac{12}{13}, (0 < \theta < \frac{\pi}{2})$ and $\cos\phi = -\frac{3}{5}, \left(\pi < \phi < \frac{3\pi}{2}\right)$. Then $\sin(\theta + \phi)$ will be

(a) $\frac{-56}{61}$ (b) $\frac{-56}{65}$ (c) $\frac{1}{65}$ (d) -56

24. If $\tan A - \tan B = x$ and $\cot B - \cot A = y$, then $\cot(A - B) =$

(a) $\frac{1}{x} + y$ (b) $\frac{1}{xy}$ (c) $\frac{1}{x} - \frac{1}{y}$ (d) $\frac{1}{x} + \frac{1}{y}$

25. $\sin 12° \sin 48° \sin 54° =$

(a) 1/16 (b) 1/32 (c) 1/8 (d) 1/4

20. The sum $S = \sin\theta + \sin 2\theta + ... + \sin n\theta$, equals

(a) $\sin\frac{1}{2}(n+1)\theta \sin\frac{1}{2}n\theta / \sin\frac{\theta}{2}$

(b) $\cos\frac{1}{2}(n+1)\theta \sin\frac{1}{2}n\theta / \sin\frac{\theta}{2}$

(c) $\sin\frac{1}{2}(n+1)\theta \cos\frac{1}{2}n\theta / \sin\frac{\theta}{2}$

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