

SAINIK SCHOOL GOPALGANJ

SUB: MATHEMATICS

CLASS-XI

ASSIGNMENT

Chapter 3: Trigonometric Functions

(Q1 to 10) There are four Options against each question. Choose the option which you consider the most appropriate as your answer.

1. Radian measure of $-37^{\circ}30'$
(a) $-\frac{3\pi}{5}$ (b) $-\frac{5\pi}{24}$ (c) $-\frac{7\pi}{5}$ (d) $-\frac{3\pi}{7}$
2. Length of an arc of circle of radius 5 cm subtending an angle of 15°
(a) $\frac{-7\pi}{5}$ (b) $\frac{\pi}{5}$ (c) $\frac{5\pi}{13}$ (d) $\frac{5\pi}{12}$
3. If $\tan A + \cot A = 4$ then $\tan^4 A + \cot^4 A =$
(a) 110 (b) 191 (c) 80 (d) 194
4. If $\sin x = \frac{12}{13}$, x lies in II quadrant then, value of $\cos x$ is
(a) $-\frac{13}{5}$ (b) $\frac{13}{5}$ (c) $-\frac{5}{13}$ (d) $\frac{3}{5}$
5. If $\sec x = x + \frac{1}{4x}$ then $\sec x + \tan x =$
(a) x or $\frac{2}{x}$ (b) x or $\frac{1}{2x}$ (c) x or $\frac{1}{x}$ (d) none
6. If $\tan x = \frac{-1}{\sqrt{5}}$ and x lies in IV quadrant then $\cos x =$
(a) $\frac{\sqrt{5}}{\sqrt{6}}$ (b) $\frac{5}{\sqrt{6}}$ (c) $\frac{1}{\sqrt{6}}$ (d) $\frac{1}{2}$
7. If A , B and C are three angles of a triangle then $\frac{\sin A - \sin C}{\cos C - \cos A} =$
(a) $\tan B$ (b) $\tan C$ (c) $\cot C$ (d) $\cot B$
8. $\sin \frac{\pi}{10} \sin \frac{13\pi}{10} =$
(a) $\frac{7}{11}$ (b) $\frac{-1}{4}$ (c) $\frac{-1}{5}$ (d) $\frac{-1}{3}$
9. General solution of $\tan 3x = -1$ is
(a) $\frac{n\pi}{3} - \frac{\pi}{2}$ (b) $\frac{n\pi}{3} + \frac{\pi}{12}$ (c) $\frac{n\pi}{2} + \frac{\pi}{12}$ (d) $\frac{n\pi}{3} - \frac{\pi}{12}$
10. A general solution of $\sin 2x + \cos x = 0$ is

(a) $2n\pi - \frac{\pi}{3}$, $n \in Z$ (b) $2n\pi + \frac{\pi}{2}$, $n \in Z$ (c) $(2n+1)\pi - \frac{\pi}{2}$, $n \in Z$ (d) $2n\pi - \frac{\pi}{2}$, $n \in Z$

11. Solve $\cos x + \cos 3x - \cos 2x = 0$

12. Show that $\sin^2 24^\circ - \sin^2 6^\circ = \frac{\sqrt{5}-1}{8}$

13. If $\tan \frac{x}{2} = \frac{3}{4}$, $\pi < x < \frac{3\pi}{2}$, find $\sin \frac{x}{2}$ and $\cos \frac{x}{2}$

14. Show that $\frac{\sin 5A - \sin 3A}{\cos 5A + \cos 3A} = \tan A$.

15. Show that $\cot 4x (\sin 5x + \sin 3x) = \cot x (\sin 5x - \sin 3x)$

16. If $\sin x = n \sin (x + 2\alpha)$ then prove that $\tan (x + \alpha) = \frac{1+n}{1-n} \tan \alpha$

17. Show that $\frac{\cos 6x + 6\cos 4x + 15\cos 2x + 10}{\cos 5x + 5\cos 3x + 10\cos x} = 2\cos x$

18. Show that $\sin 4x = 4\sin x \cos^3 x - 4\cos x \sin^3 x$

19. Prove that $\tan 6^\circ \tan 42^\circ \tan 66^\circ \tan 78^\circ = 1$

20. If $\tan A = \frac{1 - \cos B}{\sin B}$, find the value of $\tan 2A$