Zero Period

Artifically Generated worksheets and sample papers for CBSE.

Chapter: Trigonometry | Total Questions: 20

Difficulty: Hard | Subject: Mathematics | Grade: 10

Class 10 Trigonometry - Hard Difficulty Questions

1. Prove that: $\tan^{-1}(\sqrt{(1+x^2)} - \sqrt{(1-x^2)}) / \sqrt{(1+x^2)} + \sqrt{(1-x^2)} = \pi/4 - 1/2 \cos^{-1}x^2$

2. If $\sin x + \sin^2 x = 1$, prove that $\cos^{12}x + 3\cos^8 x + 3\cos^4 x + 1 = 2$.

3. Solve for x: $\sin(3x) + \cos(2x) = 0$ for $0 \leq x \leq 2\pi$

4. Find the general solution of: $2\sin^2 x + \sqrt{3} \cos x + 1 = 0$

5. If $\tan x + \tan 2x + \tan 3x = \tan x \tan 2x \tan 3x$, prove that $x = n\pi/3$, where n is an integer.

6. Without using tables, find the value of: $\sin(75°) + \cos(75°)$

7. If $\sin \theta + \text{cosec } \theta = 2$, then find the value of $\sin^n\theta + \text{cosec}^n\theta$

8. Prove that: $\cos 20° \cos 40° \cos 80° = 1/8$

9. Solve: $\sin x + \cos x = 1 + \sin x \cos x$

10. Prove: $\sin(A+B)\sin(A-B) = \sin^2 A - \sin^2 B$

11. If A, B, C are the angles of a triangle, prove that $\sin(A/2)\sin(B/2)\sin(C/2) \leq 1/8$

12. Find the value of: $\cos 10° \cos 30° \cos 50° \cos 70°$

13. Prove that: $\tan^{-1}(1/2) + \tan^{-1}(1/5) + \tan^{-1}(1/8) = \pi/4$

14. Solve: $\sin^{-1}x + \sin^{-1}(1-x) = \cos^{-1}x$

15. If $\tan\theta + \tan 2\theta + \tan 3\theta = 0$, then prove that $\theta = n\pi/3$ or $\theta = n\pi/3 + \pi/3$ where n is an integer.

16. Show that $\sin^{-1}(3/5) + \sin^{-1}(8/17) = \cos^{-1}(36/85)$

17. Solve for x: $\cos^{-1}(x) + \cos^{-1}(2x) = \pi/2$

18. Prove that: $\cos^{-1}(4/5) + \tan^{-1}(3/5) = \tan^{-1}(27/11)$

19. Find the general solution of: $\cos 3x + 8\cos x = 0$

20. If $\sin x + \cos x = \sqrt{2}$, then find the value of $\tan 3x$.

Note: These questions require a strong understanding of trigonometric identities, formulas, and techniques for solving trigonometric equations. Some questions might involve multiple steps and require creative problem-solving skills. The difficulty level is subjective and may vary depending on the student's background.