ILLAWARRA TUTORING

In this worksheet you will develop techniques to solve trigonometric equations over specified intervals. You will practise a variety of methods including factoring, using trigonometric identities, and transforming equations. Remember to show all your working and check that your solutions lie within the given interval.

Easy Questions

1. Solve $\sin x = 0$ for x in the interval $[0, 2\pi]$.
2. Solve $\cos x = 1$ for x in the interval $[0, 2\pi]$.
3. Solve $\tan x = 0$ for x in the interval $[0, 2\pi]$.
4. Solve $\sin x = \dfrac{1}{2}$ for x in the interval $[0, 2\pi]$.
5. Solve $\cos x = -\dfrac{1}{2}$ for x in the interval $[0, 2\pi]$.

Intermediate Questions

6. Solve $2\sin x = 1$ for x in the interval $[0, 2\pi]$.
7. Solve $2\cos x = -1$ for x in the interval $[0, 2\pi]$.
8. Solve $3\sin x - 1 = 0$ for x in the interval $[0, 2\pi]$.
9. Solve $2\cos^2 x - 1 = 0$ for x in the interval $[0, 2\pi]$.
10. Solve $\sin^2 x - \cos^2 x = 0$ for x in the interval $[0, 2\pi]$.
11. Solve $\sin x\,(2\cos x - 1) = 0$ for x in the interval $[0, 2\pi]$.
12. Solve $\cos^2 x - \cos x = 0$ for x in the interval $[0, 2\pi]$.
13. Solve $\sin 2x = \sqrt{3}\cos x$ for x in the interval $[0, 2\pi]$.
14. Solve $2\sin^2 x - \sin x - 1 = 0$ for x in the interval $[0, 2\pi]$.
15. Solve $\cos 2x = \cos x$ for x in the interval $[0, 2\pi]$.
16. Solve $\sin 2x = \cos 2x$ for x in the interval $[0, 2\pi]$.
17. Solve $\sin x = \sin 2x$ for x in the interval $[0, 2\pi]$.

18. Solve $\cos x = \cos 3x$ for x in the interval $[0, 2\pi]$.
19. Solve $\sin^2 x = \cos x$ for x in the interval $[0, 2\pi]$.
20. Solve $\tan x = \sqrt{3}$ for x in the interval $[0, 2\pi]$.

Hard Questions

21. Solve $2\sin^2 x - \sqrt{2}\sin x \cos x - \cos^2 x = 0$ for x in the interval $[0, 2\pi]$.
22. Solve $\sin x + \sin 3x = 0$ for x in the interval $[0, 2\pi]$.
23. Solve $\cos x + \cos 2x = 0$ for x in the interval $[0, 2\pi]$.
24. Solve $\sin x \cos x = \dfrac{1}{4}$ for x in the interval $[0, 2\pi]$.
25. Solve $\cos^2 x - \sin x = 0$ for x in the interval $[0, 2\pi]$.
26. Solve $2\sin x \cos x + \sin x = 0$ for x in the interval $[0, 2\pi]$.
27. Solve $\sin x + \sqrt{3}\cos x = 1$ for x in the interval $[0, 2\pi]$.
28. Solve $\tan^2 x - 3\tan x + 2 = 0$ for x in the interval $[0, 2\pi]$.
29. Solve $\sin 2x - \sin x = 0$ for x in the interval $[0, 2\pi]$.
30. Solve $\cos 2x - \sin x = 0$ for x in the interval $[0, 2\pi]$.