ILLAWARRA TUTORING

In this worksheet you will develop techniques to solve trigonometric equations over specified intervals. Read each question carefully and show all your working.

Easy Questions

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

Intermediate Questions

6. Solve $2\sin\theta - 1 = 0$ for $\theta \in [0, 2\pi]$.
7. Solve $\sin\theta - \cos\theta = 0$ for $\theta \in [0, 2\pi]$.
8. Solve $\sin\theta + \sqrt{3}\cos\theta = 0$ for $\theta \in [0, 2\pi]$.
9. Solve $\sin\theta = \sin\left(\dfrac{\pi}{3}\right)$ for $\theta \in [0, 2\pi]$.
10. Solve $\cos\theta = \cos\left(\dfrac{\pi}{4}\right)$ for $\theta \in [0, 2\pi]$.
11. Solve $\tan\theta = \tan\left(\dfrac{\pi}{6}\right)$ for $\theta \in [-\pi, \pi]$.
12. Solve $2\cos^2\theta - 1 = 0$ for $\theta \in [0, 2\pi]$.
13. Solve $\sin\theta\cos\theta = 0$ for $\theta \in [0, 2\pi]$.
14. Solve $\sin^2\theta - \cos^2\theta = 0$ for $\theta \in [0, 2\pi]$.
15. Solve $2\sin\theta\cos\theta = \sin\theta$ for $\theta \in [0, 2\pi]$.
16. Solve $2\sin\theta = 1 - \cos\theta$ for $\theta \in [0, 2\pi]$.
17. Solve $\sin\theta + \sin 2\theta = 0$ for $\theta \in [0, 2\pi]$.
18. Solve $\cos\theta - \cos 2\theta = 0$ for $\theta \in [0, 2\pi]$.

19. Solve $\sec\theta = 2$ for $\theta \in [0, 2\pi]$.
20. Solve $\csc\theta = 2$ for $\theta \in [0, 2\pi]$.

Hard Questions

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