Skill Building 6.7

In Problems 7–30, solve each equation on the interval $0 \le \theta < 2\pi$.

7. $2\sin\theta + 3 = 2$

8. $1 - \cos\theta = \frac{1}{2}$

9. $4\cos^2\theta = 1$

10. $\tan^2\theta = \frac{1}{3}$

11. $2\sin^2\theta - 1 = 0$

12. $4\cos^2\theta - 3 = 0$

13. $\sin(3\theta) = -1$

14. $\tan\frac{\theta}{2} = \sqrt{3}$

15. $\cos(2\theta) = -\frac{1}{2}$

16. $\tan(2\theta) = -1$

17. $\sec\frac{3\theta}{2} = -2$

18. $\cot\frac{2\theta}{3} = -\sqrt{3}$

19. $2\sin\theta + 1 = 0$

20. $\cos\theta + 1 = 0$

21. $\tan\theta + 1 = 0$

22. $\sqrt{3}\cot\theta + 1 = 0$

23. $4\sec\theta + 6 = -2$

24. $5\csc\theta - 3 = 2$

25. $3\sqrt{2}\,\mathrm{co}\ \theta + 2 = -1$

26. $4\sin\theta + 3\sqrt{3} = \sqrt{3}$

27. $\cos\left(2\theta - \frac{\pi}{2}\right) = -1$

28. $\sin\left(3\theta + \frac{\pi}{18}\right) = 1$

29. $\tan\left(\frac{\theta}{2} + \frac{\pi}{3}\right) = 1$

30. $\cos\left(\frac{\theta}{3} - \frac{\pi}{4}\right) = \frac{1}{2}$

In Problems 31–40, solve each equation. Give a general formula for all the solutions. List six solutions.

31. $\sin\theta = \frac{1}{2}$

32. $\tan\theta = 1$

33. $\tan\theta = -\frac{\sqrt{3}}{3}$

34. $\cos\theta = -\frac{\sqrt{3}}{2}$

35. $\cos\theta = 0$

36. $\sin\theta = \dfrac{\sqrt{2}}{2}$ **37.** $\cos(2\theta) = -\dfrac{1}{2}$ **38.** $\sin(2\theta) = -1$ **39.** $\sin\dfrac{\theta}{2} = -\dfrac{\sqrt{3}}{2}$ **40.** $\tan\dfrac{\theta}{2} = -1$

In Problems 41–52, use a calculator to solve each equation on the interval $0 \le \theta < 2\pi$. *Round answers to two decimal places.*

41. $\sin\theta = 0.4$ **42.** $\cos\theta = 0.6$ **43.** $\tan\theta = 5$ **44.** $\cot\theta = 2$

45. $\cos\theta = -0.9$ **46.** $\sin\theta = -0.2$ **47.** $\sec\theta = -4$ **48.** $\csc\theta = -3$

49. $5\tan\theta + 9 = 0$ **50.** $4\cot\theta = -5$ **51.** $3\sin\theta - 2 = 0$ **52.** $4\cos\theta + 3 = 0$