

7.5 EXERCISES

1-38 ■ Find all solutions of the equation.

1. $\sin x - 1 = 0$
2. $\cos x + 1 = 0$
3. $2 \cos x - 1 = 0$
4. $\sqrt{2} \sin x - 1 = 0$
5. $2 \sin x + \sqrt{3} = 0$
6. $\tan x + 1 = 0$
7. $4 \cos^2 x - 1 = 0$
8. $2 \cos^2 x - 1 = 0$
9. $\sec^2 x - 2 = 0$
10. $\csc^2 x - 4 = 0$
11. $\cos x (2 \sin x + 1) = 0$
12. $\sec x (2 \cos x - \sqrt{2}) = 0$
13. $(\tan x + \sqrt{3})(\cos x + 2) = 0$
14. $(2 \cos x + \sqrt{3})(2 \sin x - 1) = 0$
15. $\cos x \sin x - 2 \cos x = 0$
16. $\tan x \sin x + \sin x = 0$
17. $4 \cos^2 x - 4 \cos x + 1 = 0$
18. $2 \sin^2 x - \sin x - 1 = 0$
19. $\sin^2 x = 2 \sin x + 3$
20. $3 \tan^2 x = \tan x$
21. $\sin^2 x = 4 - 2 \cos^2 x$
22. $2 \cos^2 x + \sin x = 1$
23. $2 \sin 3x + 1 = 0$
24. $2 \cos 2x + 1 = 0$
25. $\sec 4x - 2 = 0$
26. $\sqrt{3} \tan 3x + 1 = 0$
27. $\sqrt{3} \sin 2x = \cos 2x$
28. $\cos 3x = \sin 3x$
29. $\cos \frac{x}{2} - 1 = 0$
30. $2 \sin \frac{x}{3} + \sqrt{3} = 0$
31. $\tan \frac{x}{4} + \sqrt{3} = 0$
32. $\sec \frac{x}{2} = \cos \frac{x}{2}$
33. $\tan^2 x - 9 \tan x = 0$
34. $3 \tan^3 x - 3 \tan^2 x - \tan x + 1 = 0$
35. $4 \sin x \cos x + 2 \sin x - 2 \cos x - 1 = 0$
36. $\sin 2x = 2 \tan 2x$
37. $\cos^2 2x - \sin^2 2x = 0$
38. $\sec x - \tan x = \cos x$

39-46 ■ Find all solutions of the equation in the interval $[0, 2\pi)$.

39. $2 \cos 3x = 1$
40. $3 \csc^2 x = 4$
41. $2 \sin x \tan x - \tan x = 1 - 2 \sin x$
42. $\sec x \tan x - \cos x \cot x = \sin x$
43. $\tan x - 3 \cot x = 0$
44. $2 \sin^2 x - \cos x = 1$
45. $\tan 3x + 1 = \sec 3x$
46. $3 \sec^2 x + 4 \cos^2 x = 7$

47-54 ■ (a) Find all solutions of the equation. (b) Use a calculator to solve the equation in the interval $[0, 2\pi)$, correct to five decimal places.

47. $\cos x = 0.4$
48. $2 \tan x = 13$
49. $\sec x - 5 = 0$
50. $3 \sin x = 7 \cos x$
51. $5 \sin^2 x - 1 = 0$
52. $2 \sin 2x - \cos x = 0$
53. $3 \sin^2 x - 7 \sin x + 2 = 0$
54. $\tan^4 x - 13 \tan^2 x + 36 = 0$

55-58 ■ Graph f and g on the same axes, and find their points of intersection.

55. $f(x) = 3 \cos x + 1$, $g(x) = \cos x - 1$
56. $f(x) = \sin 2x$, $g(x) = 2 \sin 2x + 1$
57. $f(x) = \tan x$, $g(x) = \sqrt{3}$
58. $f(x) = \sin x - 1$, $g(x) = \cos x$

59. If a projectile is fired with velocity v_0 at an angle θ , then its range, the horizontal distance it travels (in feet), is modeled by the function

$$R(\theta) = \frac{v_0^2 \sin 2\theta}{32}$$

(See page 804.) If $v_0 = 2200$ ft/s, what angle should be chosen in order for the projectile to hit a target on the ground 5000 ft away?