

KEY

Practice Solving Trigonometric Equations with Multiple Angles

Solve each equation on the interval  $[0, 2\pi)$

$$25. \sin 2x = \frac{\sqrt{3}}{2} \quad \frac{\pi}{6}, \frac{\pi}{3}, \frac{7\pi}{6}, \frac{4\pi}{3} \quad 26. \cos 2x = \frac{\sqrt{2}}{2}$$

$$27. \cos 4x = -\frac{\sqrt{3}}{2} \quad \frac{5\pi}{24}, \frac{7\pi}{24}, \frac{17\pi}{24}, \frac{19\pi}{24}, \frac{29\pi}{24}, \frac{31\pi}{24}, \frac{41\pi}{24}, \frac{43\pi}{24} \quad 28. \sin 4x = -\frac{\sqrt{2}}{2}$$

$$29. \tan 3x = \frac{\sqrt{3}}{3} \quad \frac{\pi}{18}, \frac{7\pi}{18}, \frac{13\pi}{18}, \frac{19\pi}{18}, \frac{25\pi}{18}, \frac{31\pi}{18} \quad 30. \tan 3x = \sqrt{3}$$

$$31. \tan \frac{x}{2} = \sqrt{3} \quad \frac{2\pi}{3} \quad 32. \tan \frac{x}{2} = \frac{\sqrt{3}}{3}$$

$$33. \sin \frac{2\theta}{3} = -1 \quad \text{no solution} \quad 34. \cos \frac{2\theta}{3} = -1$$

$$35. \sec \frac{3\theta}{2} = -2 \quad \frac{4\pi}{9}, \frac{8\pi}{9}, \frac{16\pi}{9} \quad 36. \cot \frac{3\theta}{2} = -\sqrt{3}$$

**Solving Trigonometric Equations**

1.  $2\cos x + 1 = 0$

$$\frac{2\pi}{3}, \frac{4\pi}{3}$$

2.  $2\sin x - 1 = 0$

3.  $\sqrt{3}\csc x - 2 = 0$

$$\frac{\pi}{3}, \frac{2\pi}{3}$$

4.  $\tan x + 1 = 0$

5.  $2\sin^2 x = 1$

$$\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$$

6.  $\tan^2 x = 3$

7.  $3\sec^2 x - 4 = 0$

8.  $\csc^2 x - 2 = 0$

9.  $\tan x(\tan x - 1) = 0$

10.  $\cos x(2\cos x + 1) = 0$

11.  $\sin x(\sin x + 1) = 0$

12.  $4\sin^2 x - 3 = 0$

13.  $\sin^2 x = 3\cos^2 x$

14.  $(3\tan^2 x - 1)(\tan^2 x - 3) = 0$

15.  $\sec x \csc x - 2 \csc x = 0$

16.  $\sec^2 x - \sec x - 2 = 0$

$$\frac{\pi}{3}, \frac{5\pi}{3}$$

17.  $2\sin^2 x + 3\sin x + 1 = 0$

18.  $3\tan^3 x - \tan x = 0$

$$\frac{7\pi}{6}, \frac{11\pi}{6}, \frac{3\pi}{2}$$

19.  $2\sec^2 x + \tan^2 x - 3 = 0$

20.  $2\sin^2 x = 2 + \cos x$

21.  $2\sin x + \csc x = 0$

22.  $\csc x + \cot x = 1$