

Solve each equation for $0 \leq x < 2\pi$.

1. $\cos x = -\frac{1}{2}$

2. $\sin x = -1$

3. $\tan x = \frac{1}{\sqrt{3}}$

4. $\cos x = \frac{\sqrt{3}}{2}$

5. $1 + \cos x = 1 - \cos x$

6. $\sin x = \sqrt{3} - \sin x$

7. $2\sin^2 x = 1$

8. $4\cos^2 x = 3$

9. $4\sin x = 3\csc x$

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

11. $3\cot^2 x = 1$

12. $3\cos x = 2$

13.a) $\cos x = \frac{1}{2}$

13.b) $\cos 2x = \frac{1}{2}$

13.c) $\cos 3x = \frac{1}{2}$

14.a) $\sin x = \frac{\sqrt{3}}{2}$

14.b) $\sin 2x = \frac{\sqrt{3}}{2}$

14.c) $\sin 3x = \frac{\sqrt{3}}{2}$

15.a) $\tan x = \sqrt{3}$

15.b) $\tan 2x = \sqrt{3}$

15.c) $\tan 3x = \sqrt{3}$

16. $2\sin 2x = 1$

17. $\tan 2x = 1$

18. $\tan 4x = -\sqrt{3}$

19. $\cos^2 x + 2\cos x = 0$

20. $\sin^2 x + 5\sin x + 6 = 0$

21. $2\cos^2 x - 7\cos x + 3 = 0$

22. $6\sin^2 x + \sin x - 1 = 0$

23. $\sin^2 x - \sin x = 0$

24. $\cos^2 x + \cos x = 0$

25. $2\sin^2 x + \sin x - 1 = 0$

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

27. $2\cos^2 x - 3\cos x + 1 = 0$

28. $\sin^2 x + 3\sin x + 2 = 0$

29. $4\cos^2 x - 4\cos x + 1 = 0$

30. $\tan^2 x - \tan x = 0$

Answers:

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

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

3. $\frac{\pi}{6}, \frac{7\pi}{6}$

4. $\frac{\pi}{6}, \frac{11\pi}{6}$

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

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

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

8. $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

9. $\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

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

11. $\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

12. 0.84, 5.44

13.a) $\frac{\pi}{3}, \frac{5\pi}{3}$

13.b) $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

13.c) $\frac{\pi}{9}, \frac{5\pi}{9}, \frac{7\pi}{9}, \frac{11\pi}{9}, \frac{13\pi}{9}, \frac{17\pi}{9}$

14.a) $\frac{\pi}{3}, \frac{2\pi}{3}$

14.b) $\frac{\pi}{6}, \frac{\pi}{3}, \frac{7\pi}{6}, \frac{4\pi}{3}$

14.c) $\frac{\pi}{9}, \frac{2\pi}{9}, \frac{7\pi}{9}, \frac{8\pi}{9}, \frac{13\pi}{9}, \frac{14\pi}{9}$

15.a) $\frac{\pi}{3}, \frac{4\pi}{3}$

15.b) $\frac{\pi}{6}, \frac{2\pi}{3}, \frac{7\pi}{6}, \frac{5\pi}{3}$

15.c) $\frac{\pi}{9}, \frac{4\pi}{9}, \frac{7\pi}{9}, \frac{10\pi}{9}, \frac{13\pi}{9}, \frac{16\pi}{9}$

16. $\frac{\pi}{12}, \frac{5\pi}{12}, \frac{13\pi}{12}, \frac{17\pi}{12}$

17. $\frac{\pi}{8}, \frac{5\pi}{8}, \frac{9\pi}{8}, \frac{13\pi}{8}$

18. $\frac{\pi}{6}, \frac{5\pi}{12}, \frac{2\pi}{3}, \frac{11\pi}{12}, \frac{7\pi}{6}, \frac{17\pi}{12}, \frac{5\pi}{3}, \frac{23\pi}{12}$

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

20. No solution

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

22. $\frac{7\pi}{6}, \frac{11\pi}{6}, 0.34, 2.80$

23. $0, \frac{\pi}{2}, \pi$

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

25. $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$

26. π

27. $0, \frac{\pi}{3}, \frac{5\pi}{3}$

28. $\frac{3\pi}{2}$

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

30. $0, \frac{\pi}{4}, \pi, \frac{5\pi}{4}$