

Math 8
Supplement – Sections 3.7 and 3.8

Solve each equation. Present a general formula for all the solutions.

1. $\csc x = -\sqrt{2}$

2. $\tan x - 1 = 0$

Find the exact solutions in the interval $[0, 2\pi)$.

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

4. $\cos \frac{1}{2}x = \frac{\sqrt{3}}{2}$

5. $\cot 2x = 0$

6. $2\sin 3x = 1$

Find all solutions in the interval $[0, 2\pi)$. When possible, state exact solutions. Otherwise, state solutions to the nearest hundredth.

7. $11\cot x + 4 = -20$

8. $10\csc x - 7 = 6$

9. $17\sin^2 x - 9 = 0$

10. $\tan^2 x - \tan x - 20 = 0$

11. $6\sin 2x + 7\cos x = 0$

12. $10\cos x + 1 = -3$

13. $\cos 2x + \sin x = -2$

14. $2\cos^2 x - 7\sin x + 2 = 0$

15. $3\sec x + 8 = 1$

16. $1 + 4\cos x = 12$

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

18. $3\sin^2 x = \sin x + 2$

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

20. $\sec^2 x - 5 = 0$

21. $4\cos x = 3\sec x$

22. $\tan x \sin x - 8\sin x = 0$

23. $\csc^2 x + \csc x - 12 = 0$

24. $\tan^2 x = \sec x + 1$

25. $\sin^2 x - 7\cos x - 7 = 0$

26. $2\cos 2x - \cos x = 1$

27. $5\csc^2 x - 8\cot x - 5 = 0$

28. $5\sin 2x = 3\sin x$

29. $3\cos 2x + 5\cos x + 2 = 0$

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

Answers

1. $\frac{5\pi}{4} + 2k\pi, k \in Z$

$\frac{7\pi}{4} + 2k\pi, k \in Z$

3. $\frac{\pi}{9}, \frac{4\pi}{9}, \frac{7\pi}{9}, \frac{10\pi}{9}, \frac{13\pi}{9}, \frac{16\pi}{9}$

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

7. 2.71, 5.85

9. 0.81, 2.33, 3.95, 5.47

11. $\frac{\pi}{2}, 3.76, \frac{3\pi}{2}, 5.66$

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

15. 2.01, 4.27

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

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

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

23. 0.34, 2.80, 3.39, 6.03

25. π

27. 0.56, $\frac{\pi}{2}, 3.70, \frac{3\pi}{2}$

29. 1.40, $\pi, 4.88$

2. $\frac{\pi}{4} + k\pi, k \in Z$

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

6. $\frac{\pi}{18}, \frac{5\pi}{18}, \frac{13\pi}{18}, \frac{17\pi}{18}, \frac{25\pi}{18}, \frac{29\pi}{18}$

8. 0.88, 2.26

10. 1.37, 1.81, 4.51, 4.95

12. 1.98, 4.30

14. $\frac{\pi}{6}, \frac{5\pi}{6}$

16. no solution

18. $\frac{\pi}{2}, 3.87, 5.55$

20. 1.11, 2.03, 4.25, 5.17

22. 0, 1.45, $\pi, 4.59$

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

26. 0, 2.42, 3.86

28. 0, 1.27, $\pi, 5.01$

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