

Math 29

Additional Trigonometric Equations

Solve each equation for solutions in the interval specified. When possible, state exact solutions. Otherwise, state solutions to the nearest hundredth.

1. $\sec^2 x = 2$, $x \in [6\pi, 8\pi)$

2. $\cot x = -\sqrt{3}$, $x \in [-2\pi, 2\pi)$

3. $5 \tan^2 x + 17 \tan x = 12$, $x \in [-2\pi, 0)$

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

4. $4 \sin^2 x = 3$

5. $4 \sin^2 x = 3 \sin x$

6. $4 \sin^2 x = 3 \sin x + 1$

7. $3 \cos 2x + 5 \cos x + 2 = 0$

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

9. $\cos 3x = -1$

10. $5 \sin 2x = 3 \sin x$

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

12. $\tan 3x = -1$

13. $3 \tan x = -1$

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

15. $\csc x = \frac{2\pi}{3}$

16. $7 \cos^2 x + 5 \cos x = 0$

Answers

1. $\frac{25\pi}{4}, \frac{27\pi}{4}, \frac{29\pi}{4}, \frac{31\pi}{4}$

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

3. $-5.74, -4.47, -2.60, -1.33$

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

5. $0, 0.85, 2.29, \pi$

6. $\frac{\pi}{2}, 3.39, 6.03$

7. $1.40, \pi, 4.88$

8. $0.56, \frac{\pi}{2}, 3.70, \frac{3\pi}{2}$

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

10. $0, 1.27, \pi, 5.01$

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

12. $\frac{\pi}{4}, \frac{7\pi}{12}, \frac{11\pi}{12}, \frac{5\pi}{4}, \frac{19\pi}{12}, \frac{23\pi}{12}$

13. $2.82, 5.96$

14. $0, \frac{\pi}{3}, \frac{5\pi}{3}$

15. $0.50, 2.64$

16. $\frac{\pi}{2}, 2.37, 3.92, \frac{3\pi}{2}$