

Directions: Without a calculator, solve the following equations over the interval $[0, 2\pi)$

1) $7 \cos x + 9 = -2 \cos x$

2) $4 \csc x - 1 = 0$

3) $2 \sin x - 3 = -4$

4) $2 \sin^2 x = \sin x + 3$

5) $9 \cot^2 x + 3 = 6$

6) $6 \sin \frac{1}{3} x = 3\sqrt{3}$

7) $\frac{\tan x - \sqrt{3}}{\tan x + \sqrt{3}} = 0$

8) $\cos\left(\frac{\pi}{6} + x\right) - \cos\left(\frac{\pi}{6} - x\right) = 1$

9) $\tan\left(\pi - \frac{x}{2}\right) = -1$

Answers :

1) $x = \pi$ 2) *No solution* 3) $x = \frac{7\pi}{6}, \frac{11\pi}{6}$ 4) $x = \frac{3\pi}{2}$

5) $x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$ 6) $x = \pi$ 7) $x = \frac{\pi}{3}, \frac{4\pi}{3}$ 8) $x = \frac{3\pi}{2}$ 9) $x = \frac{\pi}{2}$