

Solve the following equations over $[0, 2\pi)$.

1. $4\sin x + 2 = 0$

$4\sin x = -2$

$\sin x = -\frac{2}{4}$

$\sin x = -\frac{1}{2}$ $x = \frac{7\pi}{6}, \frac{11\pi}{6}$

3. $\csc x = 2$

$\sin x = \frac{1}{2}$

$x = \frac{\pi}{6}, \frac{5\pi}{6}$

5. $4\sec x - 8 = 0$

$4\sec x = 8$

$\sec x = 2$

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

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

7. $\cot x - \sqrt{3} = 0$

$\cot x = \sqrt{3}$

$x = \frac{\pi}{6}, \frac{7\pi}{6}$

9. $2\tan^2 x - 6 = 0$

$2\tan^2 x = 6$

$\tan^2 x = 3$

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

$x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

11. $\cos x = \sin x$

$x = \frac{\pi}{4}, \frac{5\pi}{4}$

*just look at unit circle 😊

2. $2\cos x + \sqrt{3} = 0$

$2\cos x = -\sqrt{3}$

$\cos x = -\frac{\sqrt{3}}{2}$

$x = \frac{5\pi}{6}, \frac{7\pi}{6}$

4. $4\sin^2 x - 1 = 0$

$4\sin^2 x = 1$

$\sin^2 x = \frac{1}{4}$

$\sin x = \pm\frac{1}{2}$

$x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

6. $\cos x(\cos x - 1) = 0$

$\cos x = 0$ $\cos x - 1 = 0$

$\cos x = 1$

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

$x = 0, \pi$

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

$\sec^2 x = 2$

$\cos^2 x = \frac{1}{2}$

$\cos x = \pm\frac{\sqrt{2}}{2}$

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

10. $3\cot^2 x - 1 = 0$

$3\cot^2 x = 1$

$\cot^2 x = \frac{1}{3}$

$\cot x = \pm\frac{\sqrt{3}}{3}$

$x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

12. $4\sin^2 x + 9 = 12$

$4\sin^2 x = 3$

$\sin^2 x = \frac{3}{4}$

$\sin x = \pm\frac{\sqrt{3}}{2}$

$x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$