

5.3 Review

Question 1

- Solve the equation and give all possible solutions in the interval $[0, 2\pi)$.

$$4\sin^2 x - 3 = 0$$

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

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

Question 2

- Solve the equation and give all possible solutions in the interval $[0, 2\pi)$.

$$\tan x + 1 = 0$$

$$\tan x = -1$$

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

Question 3

- Solve the equation and give all possible solutions in the interval $[0, 2\pi)$.

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

$$\cot x = \pm \frac{1}{\sqrt{3}}$$

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

Question 4

- Solve the equation and give all possible solutions in the interval $[0, 2\pi)$.

$$\sin^2 x = \cos^2 x$$

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

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

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

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

Question 5

- Solve the equation and give all possible solutions in the interval $[0, 2\pi)$.

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

$$\cos 2x = 0 \quad \cos x = -\frac{\sqrt{3}}{2}$$

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

$$x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{6}, \frac{7\pi}{6}$$

Question 6

- Solve the equation and give all possible solutions in the interval $[0, 2\pi)$.

$$\csc^2 x - 1 = 0$$

$$\csc x = \pm 1$$

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

$$\sin x = \pm 1$$

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

Question 7

- Solve the equation and give all possible solutions in the interval $[0, 2\pi)$.

$$2\sin^2 x = 2 + \cos x$$

$$2(1 - \cos^2 x) = 2 + \cos x$$

$$-2\cos^2 x - \cos x = 0$$

$$-2\cos x (\cos x + 1) = 0$$

$$-2\cos x = 0 \quad \cos x = 1$$

$$\cos x = 0$$

$$x = \frac{\pi}{2}, \frac{3\pi}{2}, 0$$

Question 8

- Solve the equation and give all possible solutions in the interval $[0, 2\pi)$.

$$\sec x \csc x = 2 \sec x$$

$$\sec x \csc x - 2 \sec x = 0$$

$$\sec x (\csc x - 2) = 0$$

$$\sec x = 0 \quad \csc x = 2$$

$$\frac{1}{\cos x} = 0$$

No soln.

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

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

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

Question 9

- Solve the equation and give all possible solutions in the interval $[0, 2\pi)$.

$$\cos x + \sin x \tan x = 2$$

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

$$\frac{\cos^2 x + \sin^2 x}{\cos x} = 2$$

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

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

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