

W5 – 5.4 Solve Linear Trigonometric Equations

MHF4U

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1) Determine approximate solutions for each equation in the interval $0 \leq x \leq 2\pi$, to the nearest hundredth of a radian.

a) $\sin x - \frac{1}{4} = 0$

b) $\cos x + 0.75 = 0$

c) $\tan x - 5 = 0$

d) $\sec x - 4 = 0$

e) $3 \cot x + 2 = 0$

f) $2 \csc x + 5 = 0$

2) Determine exact solutions for each equation in the interval $0 \leq x \leq 2\pi$.

a) $\sin x + \frac{\sqrt{3}}{2} = 0$

b) $\cos x - 0.5 = 0$

c) $\tan x - 1 = 0$

d) $\cot x + 1 = 0$

3) Determine approximate solutions for each equation in the interval $0 \leq x \leq 2\pi$, to the nearest hundredth of a radian.

a) $\sin^2 x - 0.64 = 0$

b) $\cos^2 x - \frac{4}{9} = 0$

c) $\tan^2 x - 1.44 = 0$

d) $\sec^2 x - 2.5 = 0$

4) Determine exact solutions for each equation in the interval $0 \leq x \leq 2\pi$.

a) $\sin^2 x - \frac{1}{4} = 0$

b) $\cos^2 x - \frac{3}{4} = 0$

c) $\tan^2 x - 3 = 0$

d) $3\csc^2 x - 4 = 0$

5) Determine solutions for each equation in the interval $0 \leq x \leq 2\pi$.

a) $3 \sin x = \sin x + 1$

b) $5 \cos x - \sqrt{3} = 3 \cos x$

c) $7 \sec x = 7$

d) $2 \csc x + 17 = 15 + \csc x$

Answer Key

1)a) 0.25, 2.89 b) 2.42, 3.86 c) 1.37, 4.51 d) 1.32, 4.97 e) 2.16, 5.3 f) 3.55, 5.87

2)a) $\frac{4\pi}{3}, \frac{5\pi}{3}$ b) $\frac{\pi}{3}, \frac{5\pi}{3}$ c) $\frac{\pi}{4}, \frac{5\pi}{4}$ d) $\frac{3\pi}{4}, \frac{7\pi}{4}$

3)a) 0.93, 2.21, 4.07, 5.36 b) 0.84, 2.3, 3.98, 5.44 c) 0.88, 2.27, 4.02, 5.41 d) 0.89, 2.26, 4.03, 5.4

4)a) $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$ b) $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$ c) $\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$ d) $\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

5)a) $\frac{\pi}{6}, \frac{5\pi}{6}$ b) $\frac{\pi}{6}, \frac{11\pi}{6}$ c) 0 or 2π d) $\frac{7\pi}{6}, \frac{11\pi}{6}$