

6.6 Solving Trigonometric Equations

EXAMPLES

1) Solve $\sin x = -\frac{1}{2}$ on $[-\pi, \pi]$.

2) Solve $\cos \theta = -1$ on $[0, 2\pi]$.

3) Solve $\sqrt{2} \sin \theta + 1 = 0$ on $[-3\pi/2, \pi/2]$.

4) Solve $\tan \theta + \sqrt{3} = 0$ on $[-\pi/2, \pi/2]$.

5) Solve $\sin 2x = 0$ on $[-\pi, \pi]$.

6) Solve $\cos 2x = -\frac{\sqrt{2}}{2}$ on $[0, 2\pi]$.

7) Solve $\tan 2\theta = -1$ on $[-\pi, 0]$.

8) Solve $\sin \frac{\theta}{2} = \frac{\sqrt{3}}{2}$ on $[0, 2\pi]$.

Find the number of solutions on the given interval.

1) $\cos x = -2/3$ on $[-2\pi, \pi]$.

2) $\tan \theta = 4$ on $-3\pi \leq \theta \leq \pi$

3) $\tan \theta = 0$ on $0 \leq \theta \leq 3\pi$

4) $\sin x = -1$ on $-\pi \leq x \leq 3\pi$

5) $\cos x = 2$ on $[0, 2\pi]$

6) $\cos x = 0$ on $[-\pi, \pi/2]$ (Use caution at the endpoints!)

More general equations.

Solve over the reals:

1) $\sin x = 1$

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

3) $\tan x = -\frac{1}{\sqrt{3}}$