Analytic Trigonometry

7.8 Trigonometric Equations

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By Inspection

Example

Solve each of the following equations over $[0, 2\pi]$:

- $\cos x = \frac{1}{2}$
- $\sin(2x) = \frac{1}{2}$

Example

Solve the equation $\cos x = \frac{\sqrt{2}}{2}$.

Example

Solve the equation $\tan(2x) = -\frac{\sqrt{3}}{3}$.

Using Algebraic Techniques

Example

Solve

$$6\cos\theta + 1 = -2 \quad \text{on} \quad 0 \leq \theta < 2\pi.$$

Example

Solve

$$2\sin^2\theta - \sin\theta - 1 = 0 \quad \text{on} \quad 0 \leq \theta < 2\pi.$$

Using Identities

Example

Solve

$$\sin x = -\cos x \quad \text{on} \quad 0 \leq \theta < 2\pi.$$

Example

Solve

$$\sin x + \csc x = 2 \quad \text{on} \quad 0 \leq \theta < 2\pi.$$