# TRIGONOMETRY

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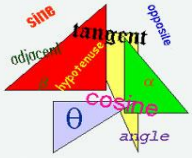
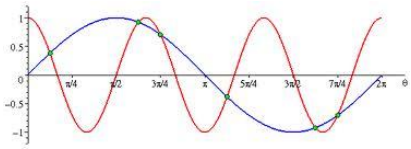





## Trigonometric Equations




Trigonometric Equations
- Solving
- Applications





## Trigonometric Equations

DEFINITION:
Equations that involve the trigonometric functions are called **Trigonometric Equations**

To solve trigonometric equation, we use the same techniques used in solving algebraic equations such as isolating the variable, collecting like terms, and factoring





## Trigonometric Equations

Solve the equation: $\cos\theta = \frac{1}{2}$

Give a general formula for all the solutions. List eight of the solutions.

$\theta = \frac{\pi}{3} + 2k\pi$ or $\theta = \frac{5\pi}{3} + 2k\pi$ $k$ any integer

Eight of the solutions are

$-\frac{5\pi}{3}, -\frac{\pi}{3}, \frac{\pi}{3}, \frac{5\pi}{3}, \frac{7\pi}{3}, \frac{11\pi}{3}, \frac{13\pi}{3}, \frac{17\pi}{3}$

$k=-1$ $k=0$ $k=1$ $k=2$

Solve the equation: $2\sin\theta + \sqrt{3} = 0, \quad 0 \le \theta < 2\pi$

The solution set is $\left\{\frac{4\pi}{3}, \frac{5\pi}{3}\right\}$





## Trigonometric Equations

Solve the equation: $\sin(2\theta) = \frac{1}{2}, \quad 0 \le \theta < 2\pi$

The solution set is $\left\{\frac{\pi}{12}, \frac{5\pi}{12}, \frac{13\pi}{12}, \frac{17\pi}{12}\right\}$





## Trigonometric Equations

Solve the equation: $2\sin^2\theta - 3\sin\theta + 1 = 0, \quad 0 \le \theta < 2\pi$

The solution set is $\left\{\frac{\pi}{6}, \frac{5\pi}{6}, \frac{\pi}{2}\right\}$

Solve the equation: $3\cos\theta + 3 = 2\sin^2\theta, \quad 0 \le \theta < 2\pi$

The solution set is $\left\{\frac{2\pi}{3}, \pi, \frac{4\pi}{3}\right\}$