

Solving Trig Equations involving Factoring Examples

Solve over $[0, 2\pi)$.

● $4\cos^2x - 3 = 0$

$$\cos^2x = \frac{3}{4}$$

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

$$x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$$



Solve over $[0, 2\pi)$.

GCF

● $\cos^3x = \cos x$

$$\cos^3x - \cos x = 0$$

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

$$\cos x = 0$$

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

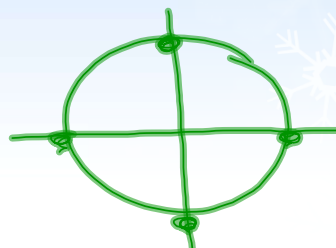
$$\cos^2x - 1 = 0$$

$$\cos^2x = 1$$

$$\cos x = \pm 1$$

$$x = 0, \pi$$

$$\begin{aligned} x^3 - x &= 0 \\ x(x^2 - 1) &= 0 \\ x = 0 \quad x^2 - 1 &= 0 \\ x^2 &= 1 \\ x &= \pm 1 \end{aligned}$$



Solving Trig Equations involving Factoring Examples

Solve over $[0, 2\pi)$.

GCF

$$2\cos x \sin x = -\cos x$$

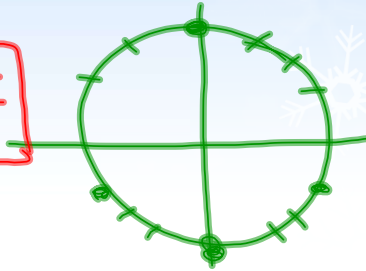
$$2 \cdot \underline{\cos x} \cdot \sin x + \underline{\cos x} = 0$$

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

$\cos x = 0$ $2\sin x + 1 = 0$
 $\sin x = -\frac{1}{2}$

$x = \frac{\pi}{2}, \frac{3\pi}{2}$ $x = \frac{7\pi}{6}, \frac{11\pi}{6}$

$2c s = -c$
 $2c s + c = 0$
 $c(2s + 1) = 0$
 $c = 0 \quad s = -\frac{1}{2}$



Solve over $[0, 2\pi)$.

TRINOMIAL

$$\sec^2 x - \sec x = 2$$

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

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

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

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

$x^2 - x - 2 = 0$
 $(x - 2)(x + 1) = 0$
 $x = 2 \quad x = -1$

