

5-4-3 Solving Trig Equations

use sum and difference identities to solve trig equations

Ex1 find solutions to:

$$\cos\left(\frac{\pi}{3} + x\right) + \cos\left(\frac{\pi}{3} - x\right) = \frac{1}{2}$$

$$(\cancel{c}a \ c\beta - \cancel{s}a \ s\beta) + (\cancel{c}a \ c\beta + \cancel{s}a \ s\beta)$$

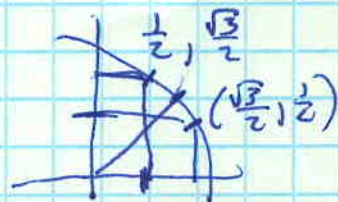
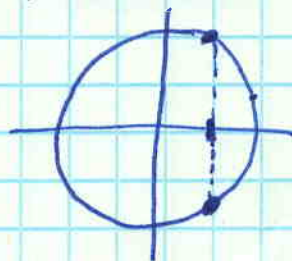
$$\cos\frac{\pi}{3} \cos x - \sin\frac{\pi}{3} \sin x + \cos\frac{\pi}{3} \cos x + \sin\frac{\pi}{3} \sin x = \frac{1}{2}$$

$$\cos\frac{\pi}{3} \cos x + \cos\frac{\pi}{3} \cos x = \frac{1}{2}$$

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

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

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



On 5-4WS p. 22 #1

$$1. \cos\left(\frac{\pi}{4} - x\right) - \sin\left(\frac{\pi}{4} - x\right) = -1$$

$$(\cancel{c}a \ c\beta + \cancel{s}a \ s\beta) - (\cancel{s}a \ c\beta - \cancel{c}a \ s\beta)$$

$$(\cos\frac{\pi}{4} \cos x + \sin\frac{\pi}{4} \sin x) - (\sin\frac{\pi}{4} \cos x - \cos\frac{\pi}{4} \sin x) = -1$$

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

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

$$\frac{\sqrt{2} \sin x}{\sqrt{2}} = \frac{-1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} \quad \sin x = \frac{-\sqrt{2}}{2}$$

$$x = \frac{5\pi}{4}, \frac{7\pi}{4}$$

