

#43)  $\frac{3\sqrt{3}\tan x}{3\sqrt{3}} = \frac{3}{3\sqrt{3}}$

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

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

#45)  $\frac{3\csc^2 x}{3} = \frac{4}{3}$

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

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

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

$x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

#47)  $4\cos^2 x - 3 = 0$

$4\cos^2 x = 3$

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

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

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

#49)  $\sin x - \tan x = 0$

$\cos x \left( \sin x - \frac{\sin x}{\cos x} \right) = 0$

$\sin x \cos x - \sin x = 0$

$\sin x (\cos x - 1) = 0$

$\sin x = 0 \quad \& \quad \cos x - 1 = 0$   
 $\cos x = 1$

$x = 0, \pi$        $x = 0$

#51)  $2\cos^2 x - \cos x = 1$

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

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

$2\cos x + 1 = 0 \quad \& \quad \cos x - 1 = 0$   
 $2\cos x = -1 \quad \cos x = 1$

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

$x = \frac{2\pi}{3}, \frac{4\pi}{3}$        $x = 0$

#55)  $2\sin 2x - \sqrt{2} = 0$

$2\sin 2x = \sqrt{2}$   
 $\sin 2x = \frac{\sqrt{2}}{2}$

$2x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

$x = \frac{\pi}{8}, \frac{3\pi}{8}, \frac{5\pi}{8}, \frac{7\pi}{8}$

4π Perim

\* #53)  $\cos^2 x + \sin x = 1$

$\cos^2 x = 1 - \sin^2 x$  (Identity prop)

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

$-\sin^2 x + \sin x = 0$

$-\frac{\sin x}{-1} (\sin x - 1) = \frac{0}{-1}$

$\sin x (\sin x - 1) = 0$

$\sin x = 0 \quad \& \quad \sin x - 1 = 0$   
 $\sin x = 1$

$x = 0, \pi$        $x = \frac{\pi}{2}$

$$\#57) \cos 4x (\cos x - 1) = 0$$

$$\cos 4x = 0 \quad \& \quad \cos x - 1 = 0$$

$$\cos x = 1$$

$$4x = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \frac{7\pi}{2}, \frac{9\pi}{2}, \frac{11\pi}{2}, \frac{13\pi}{2}, \frac{15\pi}{2} \quad \boxed{x = 1}$$

Period  
 $4\pi$

$$\boxed{x = \frac{\pi}{8}, \frac{3\pi}{8}, \frac{5\pi}{8}, \frac{7\pi}{8}, \frac{9\pi}{8}, \frac{11\pi}{8}, \frac{13\pi}{8}, \frac{15\pi}{8}}$$

$$\#59) \cos 4x - 7\cos 2x = 8 \quad \leftarrow \text{You need Double \& Formula Sec 5.3}$$

skip

$$\#63) \tan^2 \theta + \tan \theta - 12 = 0$$

$$x^2 + x - 12 = 0 \quad (\tan \theta + 4)(\tan \theta - 3) = 0$$

$$(x+4)(x-3) = 0$$

$$\tan \theta + 4 = 0 \quad \& \quad \tan \theta - 3 = 0$$

$$\tan \theta = -4$$

$$\tan \theta = 3$$

$$\theta \approx -1.326$$

$$= \pi + 1.326 = 1.816$$

$$\theta \approx 1.249$$

$$\boxed{\theta = \pi + 1.816}$$

$$\boxed{\theta \approx 1.249 + \pi}$$

$$\theta = 4.391$$

$$\boxed{\theta = 4.957}$$