$$\frac{8 \cdot 4}{416} 2 \cos^{2}t - 9 \cos t = 5 \quad [0, 2\pi]$$

$$2 \cos^{2}t - 9 \cos t - 5 = 0$$

$$\omega t = \frac{49 \pm 1/61 + 40^{7}}{4}$$

$$= \frac{9 - 11}{4} = -\frac{1}{2}$$

$$\frac{9 + 11}{4} = 5 \Rightarrow 1 \neq 0$$

$$\omega t = -\frac{1}{2} \Rightarrow \frac{1}{2} = \frac{2\pi}{3}, \frac{4\pi}{3}$$

$$22 \quad 2 \cos x - 1 = \sec x \qquad x \neq \frac{\pi}{2}, \frac{2\pi}{3}$$

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

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

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

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

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

$$4 \cos^{2}x + 4 \sin x - 5 = 0 \quad \cos^{2}x + \sin^{2}x = 1$$

$$4 (1 - \sin^{2}x) + 4 \sin x - 5 = 0$$

$$-4 \sin^{2}x + 4 \sin x - 1 = 0$$

$$\sin x = -4 (\pm \sqrt{16 - 16}) = \frac{1}{2}$$

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

5.5

sinc of an angle is between -1 & 1

$$y = \sin x$$

 $-1 \le y \le 1$ angle $= \sin^{-1} y$
 $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

[-1,1] [-4,4]

Ex exact sec(arctan 3)

 $\alpha = \arctan \frac{2}{3}$ $\tan \alpha = \frac{2}{3}$

 $sec \propto = \frac{\sqrt{13}'}{2}$

tan (tan 2) = 23

15/N

Sin (artan = accos 4)

 $\alpha = \arctan \frac{1}{2} = s \tan \alpha = \frac{1}{2}$

B = accord -> COB= 4 -> Sinb=3

 $5, \ln (\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta$ $= \frac{1}{\sqrt{5}} \frac{d}{5} - \frac{2}{\sqrt{5}} \frac{3}{5}$ $= \frac{-2}{5\sqrt{5}} = -\frac{2\sqrt{5}}{25}$

IX Cos (sin'x) Cob(sin'x) = V1-x2/ # 31 coc (5:1/x) V = Sin 1 -> pin a = 1 cse (sin'1) = X 33 pec (sin X) x>0 sec x = Vx2+4 34 cot (sin /x2-9) Sina = VX2-9 $\cot \alpha = \frac{3}{\sqrt{x^2 - 9'}}$

.

$$tan x = \frac{2}{\sqrt{x^{2} - 4^{2}}}$$

$$tan x = \frac{2}{\sqrt{x^{2} - 4^{2}}}$$

$$sec x = \frac{x}{\sqrt{x^{2} - 4^{2}}}$$

$$tan x = -\frac{3}{4}$$

$$sin \beta = \frac{4}{5} - sco \beta = \frac{3}{5}$$

$$cos (-x - \beta) = cos(-(x + \beta))$$

$$= cos(x + \beta)$$

26 tan (sin 3) pin x = 3 tan x = 3/ 1-2 sin2x _ COX-Sinx 1+25.4x COX COX + Sinx 1-2 sin x - cosx+shx - 2 sin x 1+2511XCDX COSX+SITX + 2514XCDX = Cos2 - Sin + (COX+Sinx)2 - (CODX - sen x) (CODX + sen x) (Cosx + suix) $= \frac{Cv \times - Sin \times}{Cv \times + sin \times}$ $Cv \times + sin \times$ $cv \times + sin \times$ Cutx(cocx-1) = cutx (cut x) = cot x ~

80 10 cx x - 6 cot x = 40x x+6 10 csc2x -6 cotx= 10 csc2-6 (csc2-1) = 10 cscx - 6cscx + 6 = 4 Cocx+6 v. 8.2 25, 15,12 #17 Sin(x-3) = 1 - Cotx tany Sinx Cory = Sinx Cory - Corx sing Sinx Cory = Sinx Cory Sinx Cory = 1 - cotx tang . Cos (x-y) = (14 cotx coty

cos (x-y) = cotx + tany Sin(x+y) Sinx cosy + coxxsiny Cos (x-y) Cosx cosy + sin x sin y SINXCONY + COOXSING Sinxcory + sinx siny 1 + cotx tang

$$\begin{array}{ll}
\text{Dec}(x+y) &= \frac{\cos x \cos y + \sin x \sin y}{\cos x - \sin y} \\
\text{Dec}(x+y) &= \frac{1}{\cos(x+y)} \frac{\cos(x-y)}{\cos(x-y)} \\
&= \frac{\cos(x-y)}{(\cos x \cos y + \sin x \sin y)} \left(\cos x \cos y + \sin x \sin y\right) \\
&= \frac{\cos(x-y)}{(\cos^2 x \cos^2 y - \sin^2 x \sin^2 y)} \\
&= \frac{\cos(x-y)}{(\cos^2 x \cos^2 y - \sin^2 y - \sin^2 y + \cos^2 x \sin^2 y)} \\
&= \frac{\cos(x-y)}{(\cos^2 x - \cos^2 x \sin^2 y - \sin^2 y + \cos^2 x \sin^2 y)} \\
&= \frac{\cos x \cos y + \sin x \sin y}{(\cos^2 x - \sin^2 y)} \\
&= \frac{\cos x \cos y + \sin x \sin y}{(\cos^2 x - \sin^2 y)} \\
&= \frac{\sin^2(x+y) - \sin^2(x-y)}{(\cos^2 x - \sin^2 y)} \left(\sin x \cos y + \cos x \cos y + \cos x \cos y + \cos x \cos y\right) \\
&= \sin^2(x+y) - \sin^2(x-y) = (\sin (x+y) - \sin^2(x-y)) \left(\sin x \cos y + \cos x \cos y + \cos x \cos y + \cos x \cos y\right) \\
&= \cos^2(x-y) - \sin^2(x-y) - \sin^2(x-y) + \cos^2(x-y) \\
&= \frac{\cos^2(x-y)}{(\cos^2 x \cos^2 y - \sin^2 y + \cos^2 y - \cos^2 x \cos y)} \\
&= \frac{3}{3} \sin^2(x+y) - \sin^2(x-y) + \cos^2(x-y) + \cos^2(x-y) \\
&= \cos^2(x-y) - \sin^2(x-y) + \cos^2(x-y) \\
&= \frac{\cos^2(x-y)}{(\cos^2 x \cos^2 y - \sin^2 x \cos^2 y)} \\
&= \frac{\cos^2(x-y)}{(\cos^2 x \cos^2 y - \sin^2 x \cos^2 y)} \\
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&= \frac{\cos^2(x-y)}{(\cos^2 x \cos^2 x \cos^2 x \cos^2 x \cos^2 x \cos^2 x)} \\
&= \frac{$$

2) $sin \propto cos \beta + cos \alpha sin \beta + sin \alpha soo \beta - coasin \beta$ $\rightarrow 2 sin \alpha cos \beta$ $sin^2(\alpha + \beta) - sin^2(\alpha - \beta) = (2 cos \alpha sin b)(2 sin \alpha cop)$ $= (2 cos \alpha sin \alpha)(2 sin \beta cos \beta)$ $= sin 2\alpha coo 2\beta$

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

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

$$= \tan^2 \frac{x}{2}$$

$$= \tan \frac{x}{2} = \tan \frac{x}{2}$$

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

$$\cos 2\theta = 2\cos^2 \theta - 1$$

$$1+\cos^2 \theta = \cos^2 \theta$$

$$= \sin^2 \theta = 1-\cos^2 \theta$$

$$= \sin^2 \theta = 1-\cos^2 \theta$$

$$\frac{\cos 2x}{\sin^2 x} = 2\cot^2 x - \csc^2 x$$

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

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

$$= 2\cot^2 x - \csc^2 x$$

$$= 2\cot^2 x - \csc^2 x$$