SEC 3.2 SUM, DIFFERENCE & COFUNCTION IDENTITIES

1. SUM & DIFFERENCE IDENTITIES

A) $\cos(x+y) = \cos x \cos y - \sin x \sin y$

$\cos 75 = \cos(30+45) = \cos 30 \cos 45 - \sin 30 \sin 45$

$\downarrow$

$\frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2} - \frac{1}{2} \cdot \frac{\sqrt{2}}{2}$

$\frac{\sqrt{6}}{4} - \frac{\sqrt{2}}{4}$

$\frac{\sqrt{6}-\sqrt{2}}{4}$

B) $\cos(x-y) = \cos x \cos y + \sin x \sin y$

C) $\sin(x+y) = \sin x \cos y + \cos x \sin y$

D) $\sin(x-y) = \sin x \cos y - \cos x \sin y$

E) $\tan(x+y) = \frac{\tan x + \tan y}{1 - \tan x \tan y}$

F) $\tan(x-y) = \frac{\tan x - \tan y}{1 + \tan x \tan y}$

2. COFUNCTION IDENTITIES

A) $\sin\left(\frac{\pi}{2} - x\right) = \cos x$

B) $\cos\left(\frac{\pi}{2} - x\right) = \sin x$

} ~ WAVES

C) $\tan\left(\frac{\pi}{2} - x\right) = \cot x$

D) $\cot\left(\frac{\pi}{2} - x\right) = \tan x$

} SLIDE UP/DOWN ASYMPTOTES

E) $\csc\left(\frac{\pi}{2} - x\right) = \sec x$

F) $\sec\left(\frac{\pi}{2} - x\right) = \csc x$

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EXAMPLE #49 H.W.

$$\cos\left(\frac{\pi}{2} - \theta\right) = \sin\theta$$

$$\cos\tfrac{\pi}{2}\cos\theta + \sin\tfrac{\pi}{2}\sin\theta$$

$$0 \cdot \cos\theta + 1 \cdot \sin\theta$$

$$\sin\theta$$

QED