

Even functions: \cos, \sec

Odd Functions: \sin, \csc, \tan, \cot

Even Identities:

Odd Identities:

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

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

$$-\csc x = \csc(-x)$$

$$\sec x = \sec(-x)$$

$$-\tan x = \tan(-x)$$

$$-\cot x = \cot(-x)$$

Sum and Difference Identities:

Mnemonic device:

$$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$$

$$\cos(\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$$

$$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$$

$$\sin(\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta$$

Cosine Changes Silly Signs

Sine Can't Change Signs

$$\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$$

$$\tan(\alpha - \beta) = \frac{\tan \alpha - \tan \beta}{1 + \tan \alpha \tan \beta}$$

you tan & you tan
& you get one rollover
to tan back side

$$a^2 + b^2 = c^2$$

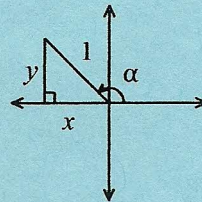
$$x^2 + y^2 = 1$$

Pythagorean Identities:

$$\cos^2 \alpha + \sin^2 \alpha = 1$$

$$1 + \tan^2 \alpha = \sec^2 \alpha \quad (\text{1 tiny sec})$$

$$\cot^2 \alpha + 1 = \csc^2 \alpha \quad (\text{1 cottage cheese})$$



Cofunction Identities: Equations that have a phase shift so they are the same

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

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

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

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

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

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

$$\sin x = \cos(90^\circ - x)$$

$$\cos x = \sin(90^\circ - x)$$

$$\tan x = \cot(90^\circ - x)$$

$$\csc x = \sec(90^\circ - x)$$

$$\sec x = \csc(90^\circ - x)$$

$$\cot x = \tan(90^\circ - x)$$