

SOME TRIG IDENTITIES

Derivatives

$$(\sin \theta)' = \cos \theta$$

$$(\cos \theta)' = -\sin \theta$$

$$(\tan \theta)' = \sec^2 \theta$$

$$(\sec \theta)' = \sec \theta \tan \theta$$

Identities

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

$$\tan^2 \theta + 1 = \sec^2 \theta$$

Half Angle formula:

$$\sin \theta \cos \theta = \frac{1}{2} \sin(2\theta)$$

$$\sin^2 \theta = \frac{1}{2}(1 - \cos 2\theta)$$

$$\cos^2 \theta = \frac{1}{2}(1 + \cos 2\theta)$$

Product to Sum formula:

$$\sin a \sin b = \frac{1}{2}[\cos(a - b) - \cos(a + b)],$$

$$\cos a \cos b = \frac{1}{2}[\cos(a - b) + \cos(a + b)],$$

$$\sin a \cos b = \frac{1}{2}[\sin(a + b) + \sin(a - b)],$$

$$\cos a \sin b = \frac{1}{2}[\sin(a + b) - \sin(a - b)].$$

Sum to Difference formula:

$$\sin(a \pm b) = \sin a \cos b \pm \cos a \sin b,$$

$$\cos(a \pm b) = \cos a \cos b \mp \sin a \sin b.$$