Half Angle Identities

$$\sin \frac{\theta}{2} = \pm \sqrt{\frac{1 - \cos \theta}{2}}$$

$$\cos \frac{\theta}{2} = \pm \sqrt{\frac{1 + \cos \theta}{2}}$$

$$\tan \frac{\theta}{2} = \pm \sqrt{\frac{1 - \cos \theta}{1 + \cos \theta}}$$

$$\tan \frac{\theta}{2} = \frac{1 - \cos \theta}{\sin \theta}$$

Double Angle Identities

$$\sin 2\theta = 2\sin \theta \cos \theta$$

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

$$\tan 2\theta = \frac{2\tan \theta}{1 - \tan^2 \theta}$$

Triple Angle Identities

$$\sin 3\theta = 3\sin \theta - 4\sin^3 \theta$$

$$\cos 3\theta = 4\cos^3 \theta - 3\cos \theta$$

$$\tan 3\theta = \frac{3\tan \theta - \tan^3 \theta}{1 - 3\tan^2 \theta}$$