Half-Angles

Half Angle Formulas

$$\sin\left(\frac{\theta}{2}\right) = \pm\sqrt{\frac{1-\cos(\theta)}{2}}$$

$$\cos\left(\frac{\theta}{2}\right) = \pm\sqrt{\frac{1+\cos(\theta)}{2}}$$

$$\tan\left(\frac{\theta}{2}\right) = \pm\sqrt{\frac{1-\cos(\theta)}{1+\cos(\theta)}}$$

Half Angle Formulas (alternate form)

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

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

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