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The **half-angle formulas** in trigonometry are useful for expressing trigonometric functions of half an angle in terms of functions of the full angle. These are especially helpful in integration and in solving trigonometric equations.

Here are the standard **half-angle identities**:

1. Sine Half-Angle Formula

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

2. Cosine Half-Angle Formula

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

3. Tangent Half-Angle Formula

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

- The ± sign depends on the quadrant in which the angle $\frac{\theta}{2}$ lies.