

**Power-Reducing**

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

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

**Double Angle**

$$\sin(2x) = 2 \sin(x) \cos(x)$$

$$\cos(2x) = 2 \cos^2(x) - 1 = \cos^2(x) - \sin^2(x)$$

**Half-Angle**

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

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

**Product-to-Sum**

$$\sin(u) \cos(v) = \frac{1}{2} [\sin(u+v) - \sin(u-v)]$$

$$\sin(u) \sin(v) = \frac{1}{2} [\cos(u-v) - \cos(u+v)]$$

$$\cos(u) \cos(v) = \frac{1}{2} [\cos(u-v) + \cos(u+v)]$$