

SOME TRIG IDENTITIES

Product to Sum formula:

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

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

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

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

Half Angle formula:

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

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

Sum to Difference formula:

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

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

Double Angle formula:

$$\sin(2a) = 2 \sin a \cos a,$$

$$\cos(2a) = 1 - 2 \sin^2 a.$$