

SOME TRIG IDENTITIES

Product to Sum formula:

$$\begin{aligned}\sin a \sin b &= \frac{1}{2}[\cos(a - b) - \cos(a + b)], \\ \cos a \cos b &= \frac{1}{2}[\cos(a - b) + \cos(a + b)], \\ \sin a \cos b &= \frac{1}{2}[\sin(a + b) + \sin(a - b)], \\ \cos a \sin b &= \frac{1}{2}[\sin(a + b) - \sin(a - b)].\end{aligned}$$

Half Angle formula:

$$\begin{aligned}\sin^2 a &= \frac{1 - \cos(2a)}{2}, \\ \cos^2 a &= \frac{1 + \cos(2a)}{2}.\end{aligned}$$

Sum to Difference formula:

$$\begin{aligned}\sin(a \pm b) &= \sin a \cos b \pm \cos a \sin b, \\ \cos(a \pm b) &= \cos a \cos b \mp \sin a \sin b.\end{aligned}$$

Double Angle formula:

$$\begin{aligned}\sin(2a) &= 2 \sin a \cos a, \\ \cos(2a) &= 1 - 2 \sin^2 a.\end{aligned}$$