

Transformation Formulae

1. Product to Sum

$$2 \sin(A) \cos(B) = \sin(A + B) + \sin(A - B)$$

$$2 \cos(A) \sin(B) = \sin(A + B) - \sin(A - B)$$

$$2 \cos(A) \cos(B) = \cos(A + B) + \cos(A - B)$$

$$2 \sin(A) \sin(B) = \cos(A + B) - \cos(A - B)$$

2. Sum to Product

$$\sin(A) + \sin(B) = 2 \sin\left(\frac{A + B}{2}\right) \cos\left(\frac{A - B}{2}\right)$$

$$\sin(A) - \sin(B) = 2 \cos\left(\frac{A + B}{2}\right) \sin\left(\frac{A - B}{2}\right)$$

$$\cos(A) - \cos(B) = 2 \cos\left(\frac{A + B}{2}\right) \sin\left(\frac{A - B}{2}\right)$$

$$\cos(A) + \cos(B) = 2 \cos\left(\frac{A + B}{2}\right) \cos\left(\frac{A - B}{2}\right)$$