

$$\Rightarrow \cos 2x = 1 - 2\cos^2 x, \quad \cos 2x = 2\sin^2 x - 1$$

$$\Rightarrow \cos\left(x - \frac{\pi}{2}\right) = \sin x$$

$$\cos\left(x + \frac{\pi}{2}\right) = -\sin x$$

$$\sin\left(y + \frac{\pi}{2}\right) = \cos y$$

$$\sin\left(y - \frac{\pi}{2}\right) = -\cos y$$

$$\Rightarrow \sin(x-y) = \sin x \cos y - \cos x \sin y$$

$$\sin(x+y) = \sin x \cos y + \cos x \sin y$$

$$\cos(x-y) = \cos x \cos y + \sin x \sin y$$

$$\cos(x+y) = \cos x \cos y - \sin x \sin y$$

$$\Rightarrow \sin 2x = 2\sin x \cos x$$

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

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

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

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

$$\Rightarrow \cos(3x) = 4\cos^3 x - 3\cos x$$

$$\sin(3x) = 3\sin x - 4\sin^3 x$$