Step-1

Complex inner product: $\mathbf{u}^H\mathbf{v} = \overline{u}_1 v_1 + \cdots + \overline{u}_n v_n$.

Step-2

Consider the following function on the interval $0 \le x \le 2\pi$.

e^{-ix}, e^{ix}

These functions will be orthogonal if their complex inner product will be zero. For this first calculate the complex conjugate of first function and then integrate the product within the limits of variable x.

$$\begin{aligned}\int_0^{2\pi} e^{ix} \cdot e^{ix} dx &= \int_0^{2\pi} e^{2ix} dx \\ &= \left[\frac{e^{2ix}}{2i}\right]_0^{2\pi} \\ &= \frac{1}{2i}\left[e^{4\pi i} - e^0\right] \\ &= \frac{1}{2i}\left[(-1)^4 - 1\right]\end{aligned}$$

$$\int_0^{2\pi} e^{ix} \cdot e^{ix} dx = 0$$

Step-3

Therefore, complex inner product is zero, this shows that the functions are orthogonal.

$$\boxed{\int_0^{2\pi} e^{ix} \cdot e^{ix} dx = 0}$$