Find all solutions in the interval [0, 2π).

cos x = sin x

Help me please

Solution

$$cosx = sinx \rightarrow \frac{cosx}{cosx} = \frac{sinx}{cosx} \rightarrow tgx = 1 \rightarrow x = \frac{\pi}{4} + \pi n, \ n \in \mathbb{Z}.$$

We can divide by $cosx \neq 0$, because $cosx$ and $sinx$ cannot equals zero simultaneously due to equality $sin^2x + cos^2x = 1$.

Therefore, in the interval $[0,2\pi]$ the equation $cosx = sinx$ has two solutions: $x = \frac{\pi}{4}$ and $x = \frac{\pi}{4} + \pi = \frac{5\pi}{4}$.