Demostrar que el conjunto de funciones cos nunt y sen nuot son mutuamente ortogonales den un intervalo to Lt Lto + 2TI la serie es la serie es la conjunto de funciones la serie es la conjunto de funciones la compansa de la conjunto della conjunto della conjunto della conjunto de la conjunto della conjunto dell f(t) = Ao+ +1. cos wo ++ +2. cos 2 wt +... An cos nuot + Bi. sen wot + Bz. sen 2 wot + ... Br. sen nwot. => derie triponométrica de fourier de f(E) siende tott

An = Stof(t).cosnwotdt StotT Seo cos² n wo t dt Bn = Stott P(E) · senn Wot dt StotT Sen nwotdt Si n=0 $A_0 = \frac{1}{T} \int_{\epsilon_0}^{t_0 + T} f(t) dt$

Sen mt. sen nt dt= 1 ("(-cos((m+n)6))+cos((m-n)6))dt $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m-n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m-n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m-n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt) dt$ $= -\frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt + \frac{1}{2} \int_{-\pi}^{\pi} (\cos((m+n)t)dt + \frac{1}{2$ Una fonción seno no es ortogonal a sú misma pero sí a todas las otras sennt $\int_{-\pi}^{\pi} cosnt \cdot cosnt dt = \begin{cases} 0 & si & m \neq n \\ TI & si & m = n \end{cases}$ Si $m \neq n \Rightarrow \lambda$ $cos m t - cos n t = \frac{1}{2} \left[cos((m+n)t) + cos((m-n)t) \right]$ $\frac{1}{2}\int_{-\pi}^{\pi}\cos(m+n)tdt + \int_{-\pi}^{\pi}\cos(m-n)tdt$ 1 | sen((m+n)+) + 1 | sen(m-n)+)] = 2 | m+n | sen((m+n)+)] = 7 | T | sen((m+n)+) | T | = 1 | T | sen((m+n)+) | T | = 2 | m+n | sen((m+n)+) | T | = 3 | T | sen((m+n)+) | T | = 4 | T | sen((m+n)+) | T | = 4 | T | sen((m+n)+) | T | = 4 | T | sen((m+n)+) | T | = 4 | T | sen((m+n)+) | T | sen((m+n)+) | T | = 4 | T | sen((m+n)+) | sen((m+n)+) | T | = 4 | T | sen((m+n)+) | sen((m+n)+) | sen((m+n)+) | T | = 4 | T | sen((m+n)+) | sen(n+n) + sen(m-n) + sen(m+n) + sen(m-n)] - C m+n m+n m+n m+n

cos mt. sennt dt = 0 + m yn => Las funciones cos nt y son nt para n=1,2,3... son mutuamente ortogonales en el intervalo [-11, TI]