CLASE 1 -

CONSIGNA DE CLASE #A (15 MINTOS)

1) DETERMINAR ANALÍTICAMENTE LOS VALORES DE ω_0, f_0 y T_0 (Ω_0, F_0 y N_0 EN EL CASO DISCRETO) DE LAS SIGUIENTES FUNCIONES:

a) $x(t) = \text{SEN}\left(2\pi \cdot 1000t + \frac{\pi}{4}\right)$

b) $x(t) = \text{SEN}\left(\frac{2}{3}t + \frac{\pi}{4}\right)$

c) $x[n] = \cos\left[\frac{5\pi}{4} \cdot n + \frac{\pi}{2}\right]$

d) $x[n] = \text{SEN}[4\pi n]$

FORMULAS =

- $\omega_0 = 2\pi \cdot f_0$
- $T_0 = 2\pi/\omega_0 = 1/f_0$
- $x(t) = A \cdot \cos(2\pi f_0 \cdot t + \phi)$
  $= A \cdot \cos(\omega_0 \cdot t + \phi)$
- $x[n] = A \cdot \cos[2\pi \cdot F_0 \cdot n + \phi]$
  $= A \cdot \cos[\Omega_0 \cdot n + \phi]$

a) $x(t) = \text{SEN}(2\pi \cdot 1000t + \pi/4)$ → ϕ

CONTÍNUA

$\omega_0 = 2\pi \cdot f_0 \rightarrow \omega_0 = 2\pi \cdot 1000 = 2000\pi \frac{rad}{s}$

$f_0 = 1000\ Hz$

$T_0 = \frac{1}{f_0} = \frac{1}{1000\,Hz} = 0{,}001\,s$

b) $x(t) = \text{SEN}\left(\frac{2}{3}t + \frac{\pi}{4}\right)$ → ϕ

CONTÍNUA

$\omega_0 = 2\pi \cdot f_0 \rightarrow \omega_0 = \frac{2}{3}\ rad/s$

$2\pi \cdot f_0 = \frac{2}{3} \rightarrow f_0 = \frac{1}{3\pi}\ Hz$

$T_0 = \frac{1}{f_0} = \frac{1}{\frac{1}{3\pi}} = 3\pi\,s$

c) $x[n] = \cos\left[\frac{5\pi}{4} \cdot n + \frac{\pi}{2}\right]$

DISCRETA

$\Omega_0 = 2\pi \cdot F_0 \rightarrow \Omega_0 = \frac{5\pi}{4}\ RAD/MTRA$

$\rightarrow F_0 = \frac{\Omega_0}{2\pi} = \frac{\frac{5\pi}{4}}{2\pi} = \frac{5}{8}$ CICLOS/MTRA

$\rightarrow N_0 = \frac{2k\pi}{\Omega_0} = \frac{2k\pi}{\frac{5}{8}} = \frac{16\pi \cdot k}{5}$ MTRAS

$k=1 \rightarrow N_0 = \frac{16\pi}{5}$ MTRAS

d) $x[n] = \text{SEN}[4\pi \cdot n]$

$\Omega_0 = 4\pi\ RAD/MTRA$

$\Omega_0 = 2\pi \cdot F_0 \rightarrow F_0 = 2$ CICLOS/MTRA

$N_0 = \frac{2k\pi}{\Omega_0} = \frac{2k\pi}{4\pi} = \frac{1}{2}k$

$k=1 \rightarrow N_0 = \frac{1}{2}$ MTRAS