Marom Schneider Cardoso   17102515

Simul 1) b) $x(t) = \dfrac{2\,\text{sinc}(2t) + \text{sinc}(t)}{\pi}$

primeira porte $\rightarrow$ $\dfrac{2\,\text{sinc}(2t)}{\pi} \Longleftrightarrow \text{ret}\left(\dfrac{w}{4}\right)$

segunda porte $\rightarrow$ $\dfrac{\text{sinc}(t)}{\pi} \Longleftrightarrow \text{ret}\left(\dfrac{w}{2}\right)$

$X(jw) = \left(\dfrac{w}{4}\right) + \text{ret}\left(\dfrac{w}{2}\right)$

$=$

Simul 2) b) $x(t) = \text{sin}(t) \cdot \cos(t/2)$

$j\pi\left[\,\delta(w+1) - \delta(w-1)\,\right] * \dfrac{1}{2\pi}\,\pi\left[\,\delta(w+\tfrac{1}{2}) + \delta(w+\tfrac{1}{2})\,\right]$

$\dfrac{j\pi}{2}\left[\,\delta(w+1-\tfrac{1}{2}) + \delta(w+1+\tfrac{1}{2}) - \delta(w-1-\tfrac{1}{2}) - \delta(w-1+\tfrac{1}{2})\,\right]$

$=$

Simul 3) b) $x(t) = \left(\text{sin}(2\pi t) + 1\right) e^{-|t|}$

$x(t) = \left(\dfrac{e^{j2\pi t} - e^{-j2\pi t}}{j2}\right) e^{-|t|} + e^{-|t|}$

$X(jw) = \dfrac{1}{2}\left(\dfrac{2\pi\,\delta(w+2\pi) - 2\pi\,\delta(w-2\pi)}{j}\right) * \dfrac{1}{2\pi} \cdot \dfrac{2}{1^2 + w^2} + \dfrac{2}{1^2 + w^2}$

tilibra

$$X(jw) = \frac{1}{2}\left(\frac{2}{1^2+(w+2\pi)^2} - \frac{2}{1^2+(w-2\pi)^2}\right) + \frac{2}{1^2+w^2}$$

$$\underset{\|}{\dot{}}$$
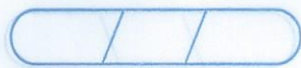
Simol 1

d) $W_s = 2\,rad/s$

$W_{ms} = 4\,rad/s$

$f_s = \dfrac{1}{T_s}$; $W_s = 2\pi \underbrace{f_s} \to \dfrac{1}{T_s}$

$4 = \dfrac{2\pi}{T_s}$

$$\boxed{T_s = \frac{2\pi}{4} = \frac{\pi}{2}} \to Com\ f_s$$

$2f_s = \dfrac{1}{T_s} \Rightarrow f_s = \dfrac{1}{2T_s}$; $4 = \dfrac{2\pi}{2T_s}$

$$\boxed{T_s = \frac{\pi}{4}} \to Com\ 2.f_s$$

$$\|$$

d) Simol 2

$W_m = \dfrac{2\pi \cdot 1}{T_s} = W_{m} = \dfrac{2\pi}{1,5}$

$W_{sm} = \dfrac{2\pi \cdot 1}{3} = \dfrac{2\pi}{3} \to NyQuist$