

$$c) \quad y(n) = x(n) - x(n-1]$$

$$y(z) = x(z) - x(z) \cdot z^{-1}$$

$$y(z) = x(z) \cdot (1 - z^{-1})$$

$$T(z) = \frac{y(z)}{x(z)} = 1 - z^{-1} = \frac{z - 1}{z}$$

$$T(j\Omega) = \frac{e^{j\Omega} - e^{j0\Omega}}{e^{j\Omega}}$$

$$= \frac{e^{j\frac{1}{2}\Omega} \cdot (e^{j\frac{1}{2}\Omega} - e^{-j\frac{1}{2}\Omega})}{e^{j\Omega}}$$

$$= 2 \cdot e^{-j\frac{1}{2}\Omega} j (\sin(\frac{1}{2}\Omega)) \longrightarrow \sin(\frac{1}{2}\Omega) = 0$$

$$\downarrow \quad \quad \quad \left(\cos(-\frac{1}{2}\Omega) + j \sin(-\frac{1}{2}\Omega) \right) j \quad \quad \quad \frac{\Omega}{2} = K\pi$$

$$j \cos(\frac{1}{2}\Omega) + \sin(\frac{1}{2}\Omega) \quad \quad \quad a = \sin(\frac{1}{2}\Omega) \quad \quad \quad \Omega = 2K\pi, \quad K \in \mathbb{N}$$

$$\tan(\alpha) = \frac{b}{a}$$

$$\tan(\alpha) = \frac{\cos(\frac{1}{2}\Omega)}{\sin(\frac{1}{2}\Omega)} = \cot(\frac{1}{2}\Omega)$$

$$\cot(\alpha) = \tan(\frac{\pi}{2} - \alpha)$$

$$\alpha = \arctan(\cot(\frac{1}{2}\Omega)) = \arctan(\tan(\frac{\pi}{2} - \frac{1}{2}\Omega))$$

$$\alpha = \frac{\pi}{2} - \frac{1}{2}\Omega$$

$$e^{j(\frac{\pi}{2} - \frac{1}{2}\Omega)}$$

Fase

