TS6-d

d) $y(n) = x(n) - x(n-2)$

$Y(z) = X(z) - X(z) \cdot z^{-2}$

$T(z) = \dfrac{Y(z)}{X(z)} = 1 - z^{-2} = \dfrac{z^2 - 1}{z^2}$

$T(j\Omega) = \dfrac{e^{2j\Omega} - e^{0j\Omega}}{e^{2j\Omega}} = \dfrac{e^{j\Omega}(e^{j\Omega} - e^{-j\Omega})}{e^{2j\Omega}}$

$= e^{-j\Omega}(2j\, sen(\Omega)) = j\, e^{-j\Omega}(2\, sen(\Omega)) \longrightarrow 2\, sen(\Omega) = 0$

$\Omega = K\pi \ , \ K \in \mathbb{N}$

$j \cdot \left[cos(-\Omega) + j\, sen(-\Omega) \right]$

$j \cdot \left[cos(\Omega) - j\, sen(\Omega) \right]$

$\underbrace{sen(\Omega)}_{a} + j\,\underbrace{cos(\Omega)}_{b}$

$tg\, \alpha = \dfrac{b}{a} = \dfrac{cos(\Omega)}{sen(\Omega)} = cot(\Omega)$

$\alpha = arctg(cot(\Omega)) = arctg(tg(\pi/2 - \Omega))$

$\alpha = \pi/2 - \Omega$

$j\, e^{-j\Omega} = e^{j(\pi/2 - \Omega)} = e^{-j(\Omega - \pi/2)}$

$cos(\Omega - \pi/2) - j\, sen(\Omega - \pi/2)$

$cos(\Omega)\,cos(\pi/2) + sen(\Omega)\,sen(\pi/2) - j\,(sen(\Omega)\cdot cos(\pi/2) - sen(\pi/2)\,cos(\Omega))$

$sen(\Omega) - j\,(-cos(\Omega))$

$sen(\Omega) + j\, cos(\Omega)$