EET-01 Ex. Aula 10 - 01 26/05/2020

Igor Caldeira Magalhães

$Z_0 = r e^{(jw_0)} \Rightarrow |z_0| = |r| \cdot |e^{(jw_0)}| = |r| = r$, logo

$$\boxed{|z| > |z_0| \Leftrightarrow |z| > r}$$

$$X(z) = \frac{1}{2\left(1 - \left(\frac{z}{z_0}\right)^{-1}\right)} + \frac{1}{2\left(1 - \left(\frac{z}{z_0^*}\right)^{-1}\right)} =$$

$$= \frac{1 - z_0^* z^{-1} + 1 - z_0 z^{-1}}{2(1 - z_0 z^{-1})(1 - z_0^* z^{-1})} = \frac{2 - z^{-1} \cdot (z_0 + z^*)}{2(1 - z_0 z^{-1})(1 - z_0^* z^{-1})} =$$

$$= \frac{2 - 2r\left(\frac{e^{jw_0} + e^{-jw_0}}{2}\right) z^{-1}}{2(1 - z_0 z^{-1})(1 - z_0^* z^{-1})} = \frac{1 - r \cdot \cos(w_0) z^{-1}}{(1 - z_0 z^{-1})(1 - z_0^* z^{-1})}$$

$$\therefore \boxed{X(z) = \frac{1 - r\cos(w_0) z^{-1}}{(1 - r e^{jw_0} z^{-1})(1 - r e^{-jw_0} z^{-1})}, \quad |z| > r}$$

//