*Bonus: Obtener los valores de la red normalizados en frecuencia e impedancia

$$T(\$) = -\frac{\frac{1}{R_1 R_3 C^2}}{\$^2 + \$\,\frac{1}{R_2 C} + \frac{1}{R_3^2 C^2}} \quad ; \quad \# = \frac{\$}{\Omega_\omega} \quad ; \quad \Omega_\omega = \omega_0 = \frac{1}{R_3 C}$$

$$T(\$) = -\frac{\frac{\omega_0}{R_1 C}}{\$^2 + \$\,\frac{\omega_0}{Q} + \omega_0^2} \rightarrow T(\#) = -\frac{\frac{\omega_0}{R_1 C}}{\omega_0^2 \#^2 + \$\,\frac{\omega_0^2}{Q} + \omega_0^2}$$

$$T(\#) = -\frac{\frac{1}{\omega_0}\,\frac{1}{R_1 C}\cdot\left(\frac{R_3}{R_3}\right)\omega_0}{\$^2 + \$\,\frac{1}{Q} + 1}$$

$$\Rightarrow T(\#) = -\frac{\frac{R_3}{R_1}}{\$^2 + \$\,\frac{1}{Q} + 1}$$

$\Omega_\omega = \omega_0 = \frac{1}{R_3 C} = 1 \rightarrow C = \frac{1}{R_3}$

$\Omega_2 = R_3 \rightarrow$

$C' = C\,\Omega_2\,\Omega_\omega = \frac{1}{R_3} R_3 1 = 1$

$R_1' = \frac{R_1}{\Omega_2} = \frac{R_3}{10}\frac{1}{R_3} = \frac{1}{10}$

$R_2' = \frac{R_2}{\Omega_2} = \frac{3R_3}{R_3} = 3$

$R_3' = \frac{R_3}{\Omega_2} = 1$

$R_4' = \frac{R_4}{\Omega_2} = \frac{R_4}{R_3} = 1$

$R_3 = R_4$ → lo impongo yo

Para poder simular desnormalicé con los siguientes valores:

$$\begin{cases} \omega_0 = 100 \text{ rad/seg} \\ R_3 = 1\,K\Omega \end{cases} \Rightarrow \begin{cases} R_1 = 100\,\Omega \\ R_2 = 3\,K\Omega \\ R_3 = 1\,K\Omega \\ R_4 = 1\,K\Omega \\ C = 10\,\mu F \end{cases}$$

$\omega_0 = 2\pi f$

$f = \frac{\omega_0}{2\pi} = 15{,}915\ Hz$

NOTA