

Home Work PHY 554 #14

Due Nov. 10, 2021

HW 1 (5 points)

Use the following identity

$$\sum_{p=-\infty}^{\infty} \delta(x-p) = \sum_{l=-\infty}^{\infty} e^{i2\pi lx} ,$$

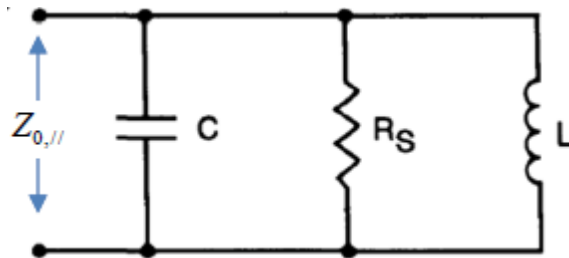
to prove Poisson summation formula:

$$\sum_{l=-\infty}^{\infty} F(lC) = \frac{1}{C} \sum_{p=-\infty}^{\infty} \tilde{F}\left(\frac{2\pi p}{C}\right),$$

where $F(z)$ and $\tilde{F}(k)$ are Fourier pairs related by

$$F(z) = \frac{1}{2\pi} \int_{-\infty}^{\infty} e^{ikz} \tilde{F}(k) dk .$$

HW 2 (5 points)



Show the impedance of above circuit can be expressed as

$$Z_{0,II} = \frac{R_s}{1 + iQ \left(\frac{\omega_R}{\omega} - \frac{\omega}{\omega_R} \right)},$$

and find the expression for Q and ω_R in terms of C , R_s , and L .