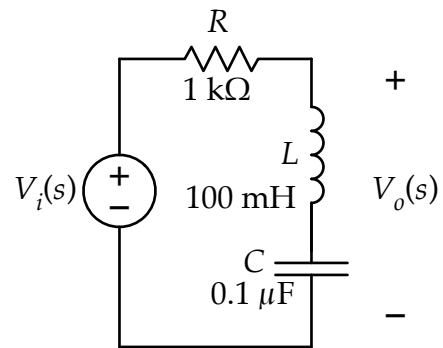


A *band-reject* or *notch* filter function can be achieved by having two transmission zeros located at exactly the characteristic frequency of transfer function denominator. The function looks like this:

$$T(s) = G_o \frac{s^2 + \omega_o^2}{s^2 + \frac{\omega_o}{Q_P} s + \omega_o^2}$$

Plot the magnitude and phase frequency responses for $\omega_o = 10,000$ rad/s ($f_o = 1590$ Hz), $Q_P = 1$, and $G_o = 1$. Extend the plot from at least 100 rad/s to 1 Mrad/s. (15.9 Hz $< f < 159$ kHz). The plots can be generated in Excel or Matlab or by circuit simulation using SPICE.

Calculate the transfer function for the circuit shown at right. (Which is to say, show that it is a notch filter.) Express your result as symbols, not numbers.



Calculate ω_o , Q_P , and G_o for the filter.

$T(s) =$ _____

$\omega_o =$ _____; $Q_P =$ _____; $G_o =$ _____