

ECE581

### Analysis of a Parallel Resonant Circuit in the Frequency Domain

Figure 1 shows a parallel L-R-C circuit.

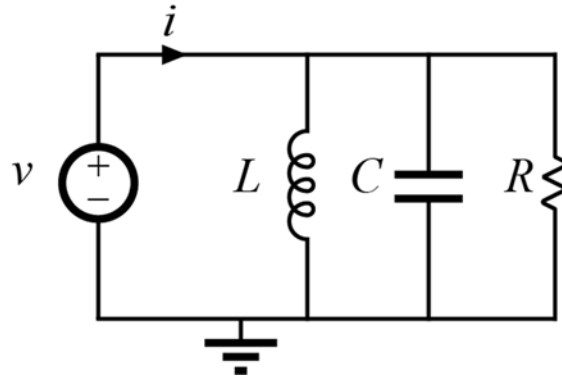


Figure 1: Parallel L-C circuit

- (a) Derive a symbolic expression for the input impedance of the circuit,  $Z(s) = V(s)/I(s)$ . Manipulate the expression into standard form.

For (b), the elements have values  $L = 40 \mu\text{H}$ ,  $C = 20 \mu\text{F}$ , and  $R = 50 \Omega$

- (b) Sketch a Bode plot of the magnitude and phase of  $Z(s)$ . Label all salient features (slopes, frequency of breakpoints, peaks of resonances) with values. Logarithmic graph paper is available on the course website.