Frequency Response

Prelab 10

Spring 2024

1 Purpose

Find the analytical expression for the magnitude and phase of a transfer function.

2 Deliverables Overview

- Typed and properly formatted derivation for both the magnitude and phase of the transfer function. *Note: All steps must be shown.*

3 Part 1

3.1 Tasks

Consider the RLC circuit in Figure 1.

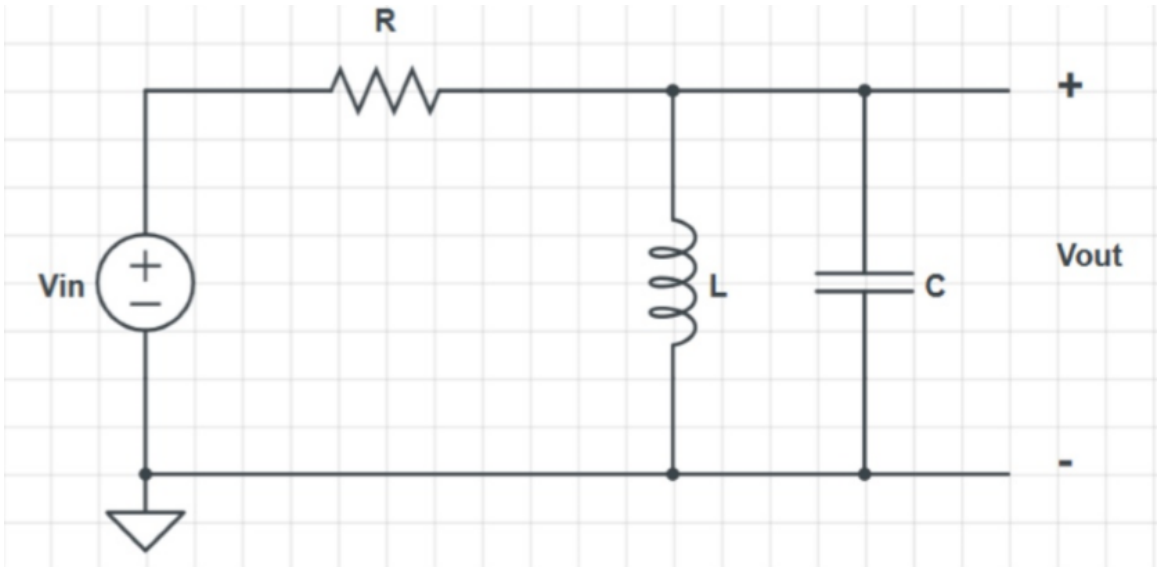

Figure 1: R = 1 kΩ, L = 27 mH, C = 100 nF

Which has the transfer function,

$$H(s) = \frac{\frac{1}{RC}s}{s^2 + \frac{1}{RC}s + \frac{1}{LC}}.$$

1. By hand, find the magnitude $|H(j\omega)|$ and the phase $\angle H(j\omega)$ for the RLC transfer function $H(s)$. Do not use your calculator or Python in this step, show all your work.