

ECE 209L - FIRST ORDER CIRCUITS - LAB 9

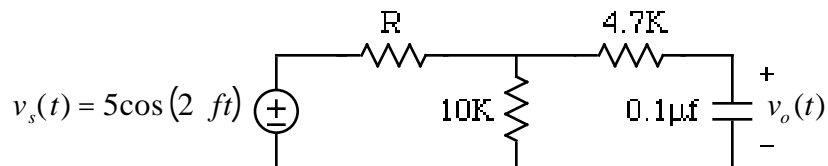
LOG PLOTS OF FREQUENCY RESPONSES

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OBJECTIVE

The objective of this lab is to plot the frequency response of the following first order RC circuit with the frequency plotted on a log scale



PARTNER 1: $R = 4.7\text{K}$ PARTNER 2: $R = 10\text{K}$

LAB

1. **Prelab** - Obtain and measure your resistor and capacitor values. Then compare your nominal and measured values. Put your results in a Table
2. **Prelab** - At what frequency is the gain $G(j\omega) = V_o(j\omega)/V_s$ of this circuit maximum. What is the gain at this frequency. You might find it helpful to find the Thevenin Equivalent of the resistors and source
3. Measure the amplitude of $v_o(t)$ at ten "representative" frequencies including the 3dB frequency - the frequency where the gain is 0.707 of its maximum value. As usual . . .
4. **Prelab** - Draw the phasor circuit with your measured values and then make use of it to obtain the transfer function $G(j\omega) = V_o(j\omega)/V_s$
5. **Prelab** - Make use of Mathcad to obtain a graph of $|G(j2\pi f)| = |V_o(j2\pi f)/V_s|$ with the frequency on a base log scale (base 10)
6. Put your data from Problem (3) on your graph from Problem (5)
7. Make use of your graph in Problem (6) to describe how well your measured data agrees with your calculated graph
8. Compare your measured 3dB frequency with the 3dB frequency from the graph