Prelab – Experiment 3
Bridge Circuits

Read the lab instruction sheet and Appendix A thoroughly, then

1 Question 1

Derive the "null" conditions described in Step 1 for ***both*** the DC and AC bridge sections of the experiment.

Hint: The reduction methods used for DC circuits work with fixed-frequency AC circuits, but reactive impedances are complex quantities, $Z_L = j\omega L$ and $Z_C = 1/j\omega C$, while $Z_R = R$ is real. You must manipulate them as complex numbers.

2 Question 2

Derive Eq. 5 in Appendix A starting from Eq. 3. Use the result to evaluate the percentage uncertainty in $R = R_1||R_2$ when R_1 is 10 kΩ ($\pm 0.5\%$) and R_2 is 1 MΩ ($\pm 10\%$).