

1) Analyze this circuit by hand finding the voltages at the two points (V_{left} , V_{right}) and their difference. Make sure that your answer agrees with the PSpice simulation in Class.

$V1 = 100\text{mV}$, 1kHz , 0V Offset

Repeat the Analysis for $R4 = 0.9\text{k}$ and $R4 = 1.1\text{k}$ **Show all work**

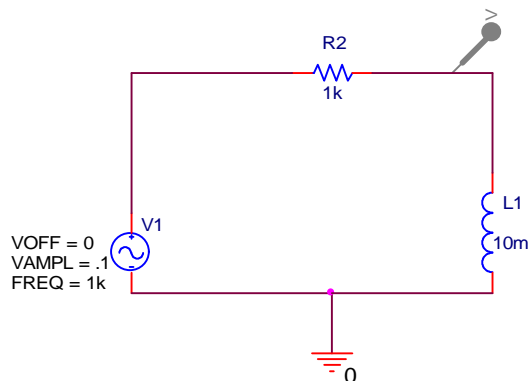
2) Assume that $R1 = R2 = R3$ are known resistors equal to R , and that $R4$ is unknown. Derive a formula for $R4$ in terms of R , the source voltage $V1$, and the voltage difference between the two divider voltages ($V_{left} - V_{right}$).

Show all work

3) In Experiment 2 we learn that an "AC Sweep" shows us how a circuit behaves at a wide range of frequencies. Run an AC Sweep PSPICE simulation from 1 to 10 Megahertz of this circuit to qualitatively (without using math) describe how the inductor $L1$ behaves at low frequencies, and how an inductor behaves at high frequencies. You should be able to derive this by thinking about the voltage division formula we have used previously.

ie. An inductor has very low resistance at X frequencies, very high resistance at X frequencies.

Print out the AC Sweep plot, and include it in your HW.



For Voltage values you may use $V1 = 100\text{mV}$, 1kHz , $V_{off} = 0$ Remember to edit the AC property value to 100mV .