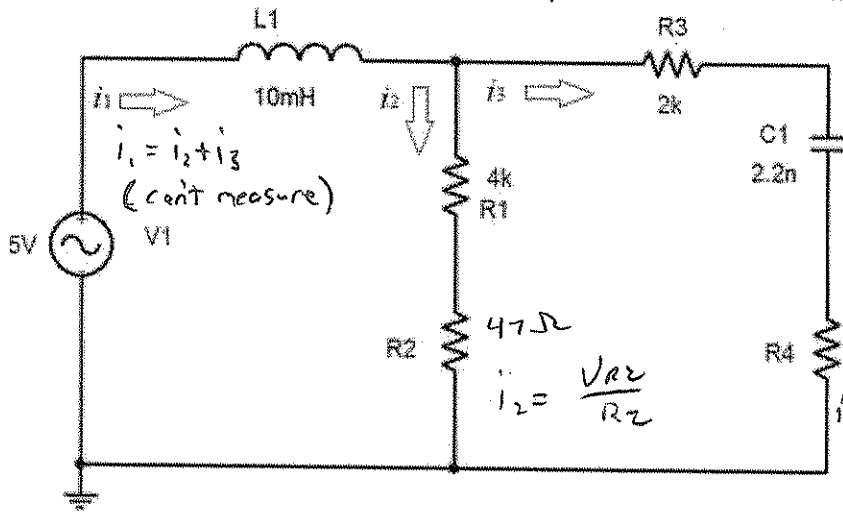


GTA

ECE 3074 Lab Validation
Deadline: Monday, February 6, 2012

Instructions for the Validation:

Constructed the circuit from lab lecture for Experiment 23 on their ANDY board.



R_2 & R_4 are shunt resistors
 • used to measure current values $47 \rightarrow 200\Omega$ typical
 • chosen to produce a measurable voltage at 1mA, while small enough to be negligible w.r.t. R_1 and R_3

Bring the circuit on the ANDY board, the Velleman oscilloscope, and the DMM to OpEL.

The grade for Week 3: Experiment 23 Validation will be based upon three sets of criteria listed below.

Proper Circuit Construction Techniques (30%):

1. Wiring is neat.
2. No wire is more than an inch above the breadboard.
3. A red wire is used for power.
4. A black wire is used for ground.

Measurements To Be Performed Before an OpEL GTA (30%):

1. Demonstrate that the amplitude and frequency of the voltage source is 5V and 40 kHz, respectively.
2. Measure the magnitude and phase of the currents, i_1 , i_2 , and i_3 .

Explanation To OpEL GTA (40%):

1. Identify whether i_1 , i_2 , and i_3 lag or lead the power supply voltage.
2. Explain your selection of values for the shunt resistors, R_2 and R_4 .

← all lag
 ← add $i_2 + i_3$ to get i_1
 $i_1 \approx 1.9 \angle -51^\circ \text{ mA}$
 $i_2 \approx 0.8 \angle -75^\circ \text{ mA}$
 $i_3 \approx 1.2 \angle -35^\circ \text{ mA}$

