EEC 100
Lab 1
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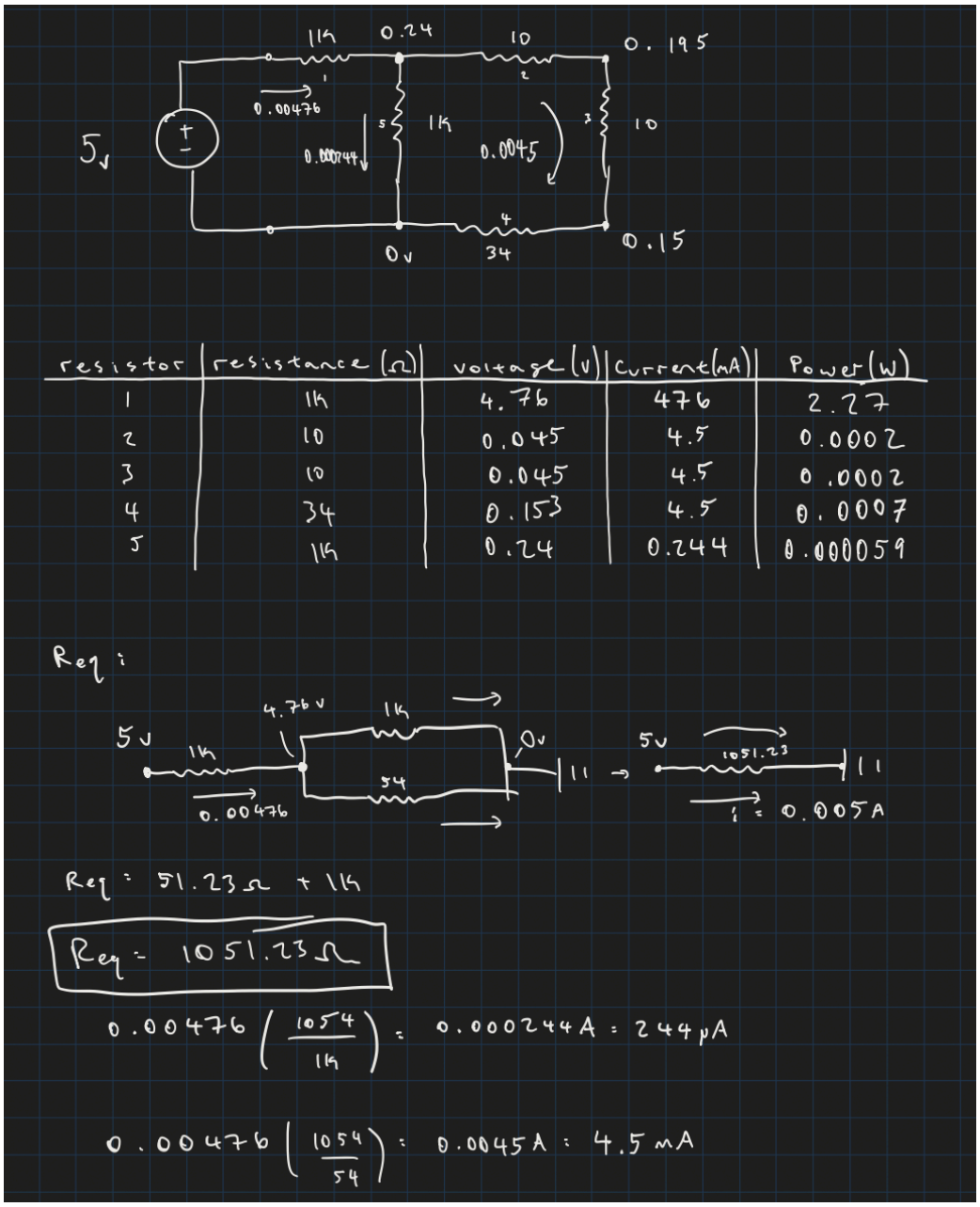
10/7/24

(1) Objective: Learn how to set up, measure, and test circuitry using the oscilloscope, digital multimeter, power supply, and waveform generator. Use and design circuitry on OrCAD and perform PSpice simulations, use and create a circuit on a breadboard.

(2) Prelab:



resistor	resistance (Ω)	voltage (V)	current (mA)	Power (W)
1	1k	4.76	476	2.27
2	10	0.045	4.5	0.0002
3	10	0.045	4.5	0.0002
4	34	0.153	4.5	0.0007
5	1k	0.24	0.244	0.000059

Req:

Req = 51.23Ω + 1k

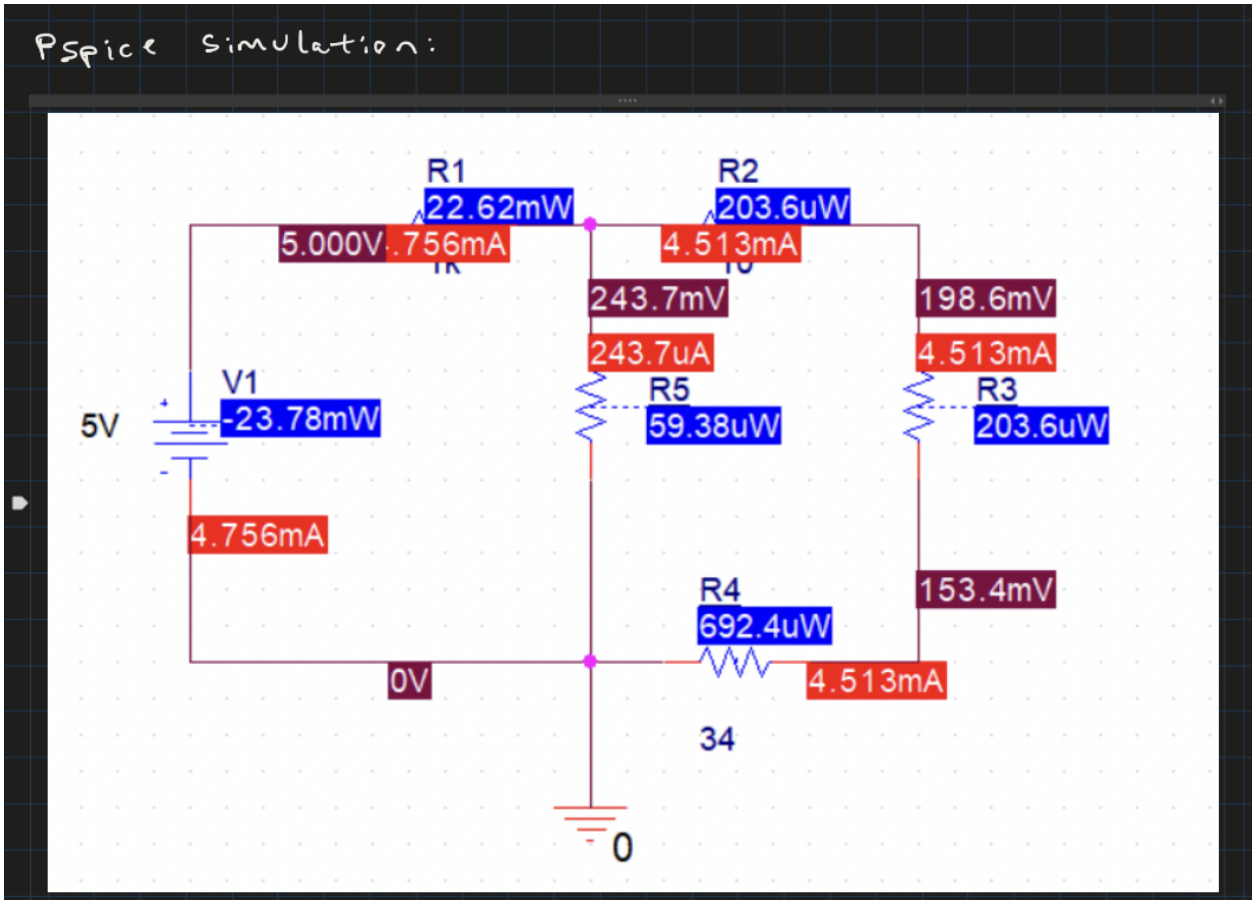
Req = 1051.23Ω

$0.00476\left(\frac{1054}{1k}\right) = 0.000244A = 244\mu A$

$0.00476\left(\frac{1054}{54}\right) = 0.0045A = 4.5mA$

(3) Simulation:

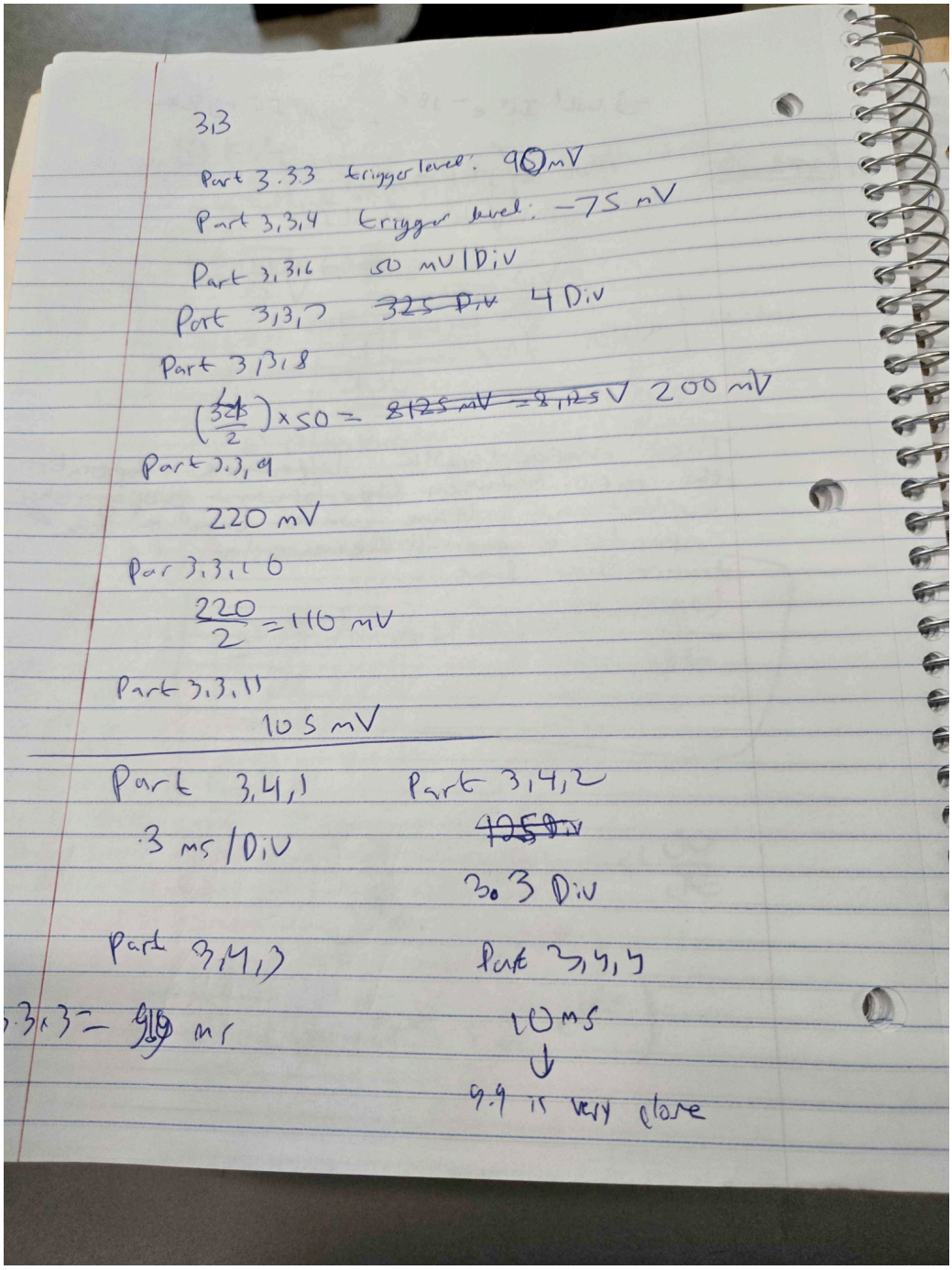
Pspice simulation:



	Volt	Current	Power
R_1	4.7563	4.756 mA	22.62mW
R_2	0.0451	4.513mA	203.6 μW
R_3	0.0452	4.513 mA	203.6μW
R_4	0.1534	4.513mA	692.4μW
R_5	0.2437	243.7μA	59.38μW

R_{eq}: 1051.233 Ω

(4) Experiment:



Part 3,4,5

~~V/t~~ $\frac{1}{0.01}$ = 100 Hz

Part 3,4,6

100.1 Hz

Part 3,5,5 ~~DC offset: 1000 Peak~~

DC offset: 550 mV

Amplitude: 525 mV

Part 3,5,6 Max offset: 9,5 V

Max Neg. offset: −9,5

Part 3,5,7

Wave move up/down w offset change

3,6,3 Peak Amplitude = ~~10~~ V_p

3,6,5 Range: ~~100 mV~~ 10V

3,6,6 Vrms: ~~24.1 mV rms~~ 7.1 V_{rms}

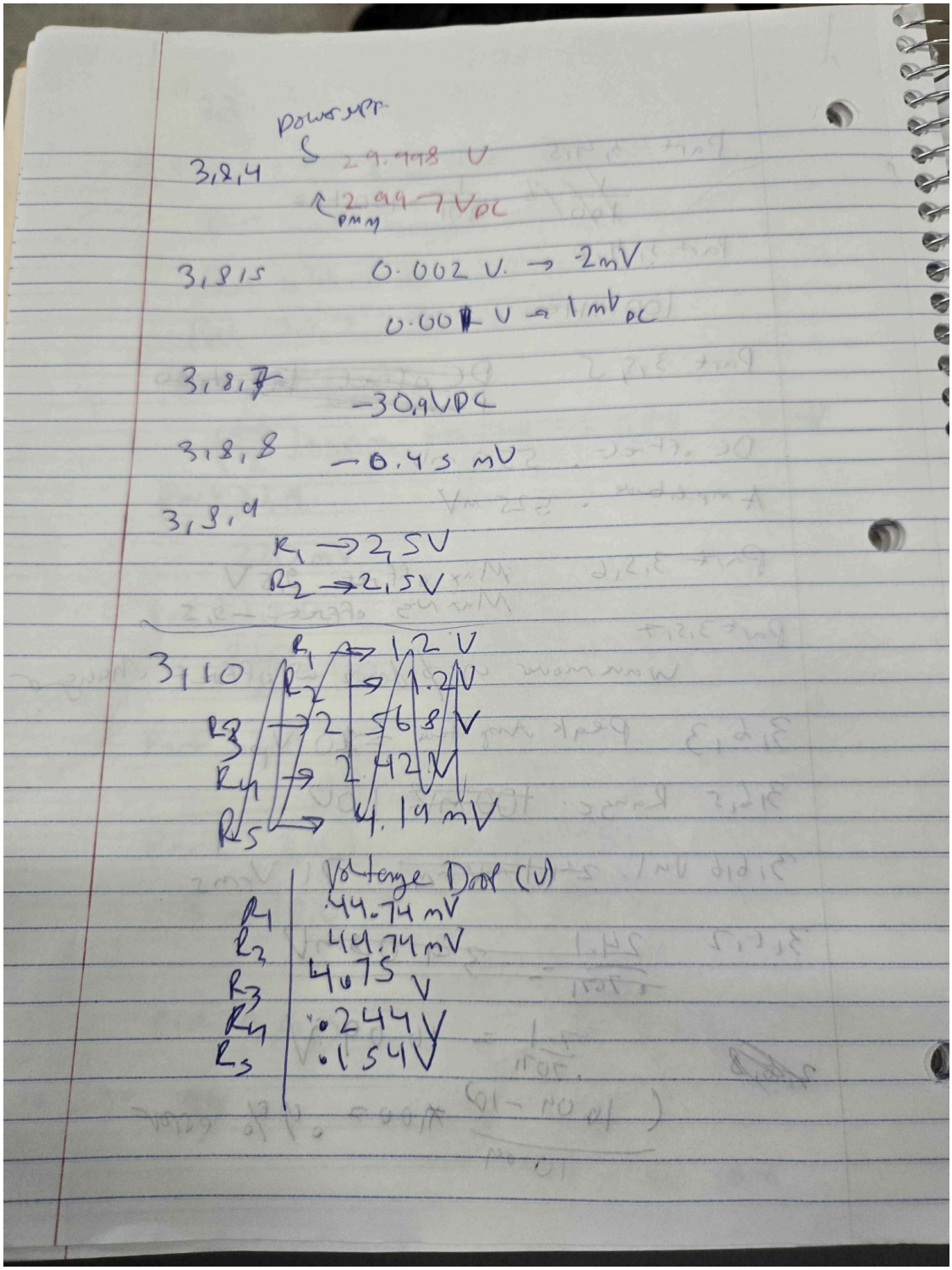
3,6,2 ~~24.1 / .7071 = 34.03 mV~~

$\frac{7.1}{.7071}$ = 10.09 V

~~3,6,8~~

$\frac{(10.09 - 10)}{10.09} \times 100$ = .9% error

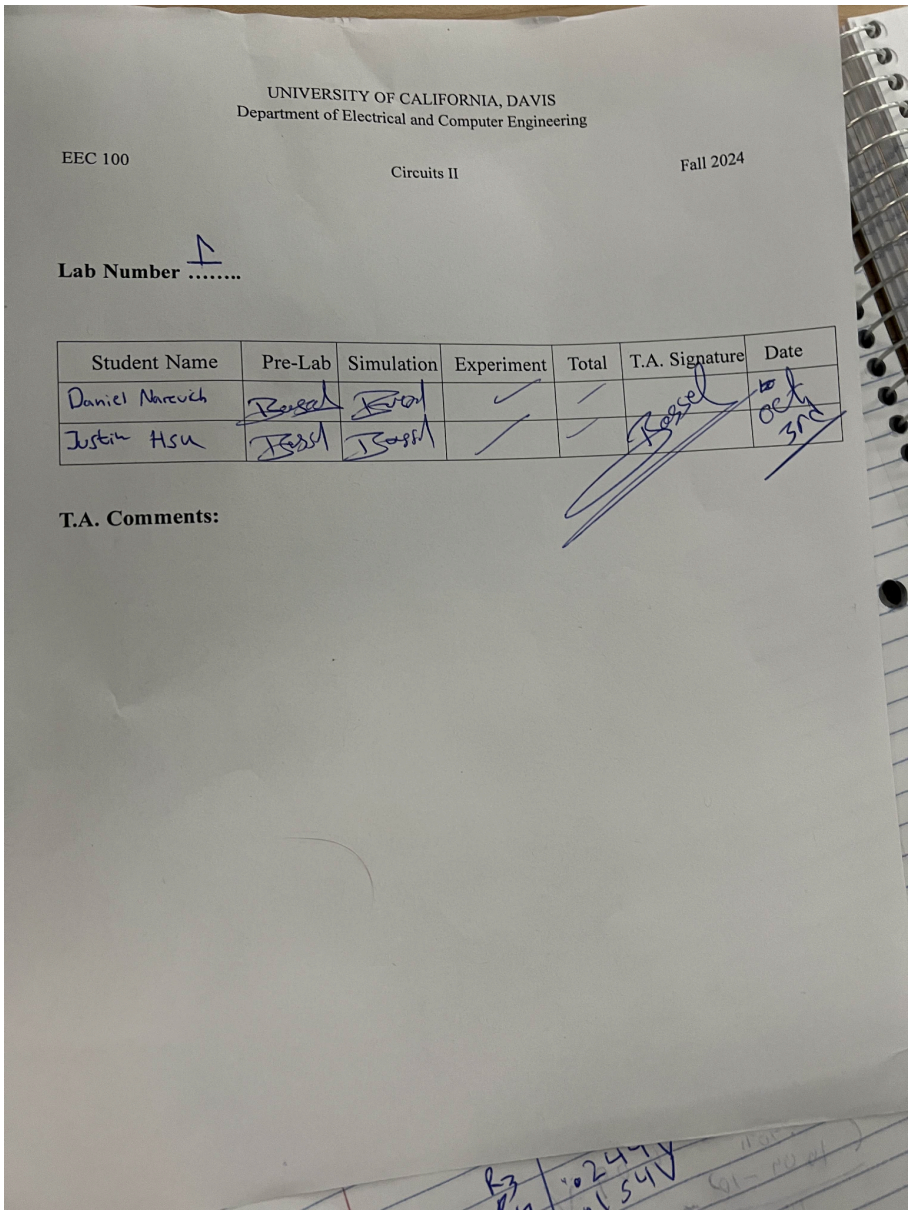
Note: 3.8.4-3.8.8 is actually the section 3.7 questions and 3.8.9-3.10 is the section 3.8 questions



(5) Conclusion: The calculations I made from the prelab agreed with the simulation results from PSpice, as well as the real circuit testing we did with the breadboard and multimeter. This is to be expected, as it was a basic voltage divider circuit. The theoretical calculations from simulation results and my calculations fell within an acceptable range of the measurements.

This lab provided valuable information and experience in using the various testing equipment found in the lab like the waveform generator, multimeter, oscilloscope and power supply. In the future if I ever have to use this equipment again I will know how to use it and not spend time figuring out how to configure the right settings or whether my readings were correct.

(6) Checkoff:



UNIVERSITY OF CALIFORNIA, DAVIS
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EEC 100 Circuits II Fall 2024

Lab Number 1

Student Name	Pre-Lab	Simulation	Experiment	Total	T.A. Signature	Date
Daniel Narevich			✓			Oct 30
Justin Hsu			✓			

T.A. Comments: