Lab 5: Voltage Divider

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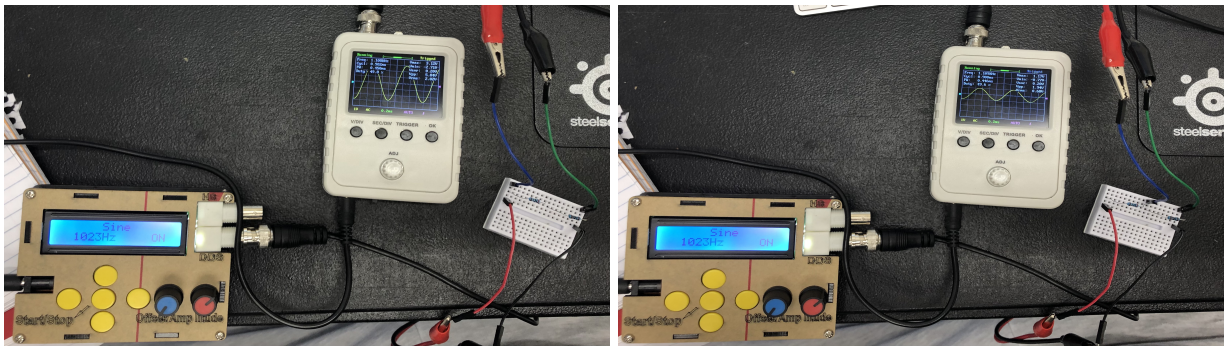
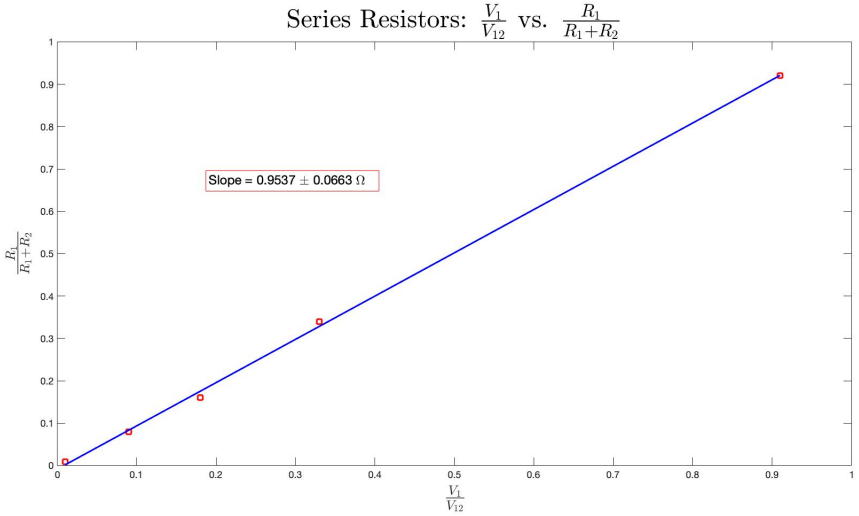
Part 1

Table 1: Series Resistors						
R_1	R_2	V_1	V/DIV for V_1	V_{12}	$\frac{R_1}{R_1+R_2}$	$\frac{V_1}{V_{12}}$
1k	2k	0.68V	1V	2.02V	0.33k	0.34V
1k	100	1.85V	1V	2.02V	0.91k	0.92V
1k	4.7k	0.33V	1V	2.02V	0.18k	0.16V
1k	10k	0.16V	1V	2.02V	0.09k	0.08V
1k	100k	0.019V	10mV	2.02V	0.0099k	0.0094 V

Picture 1



Graph 1



Discussion 1

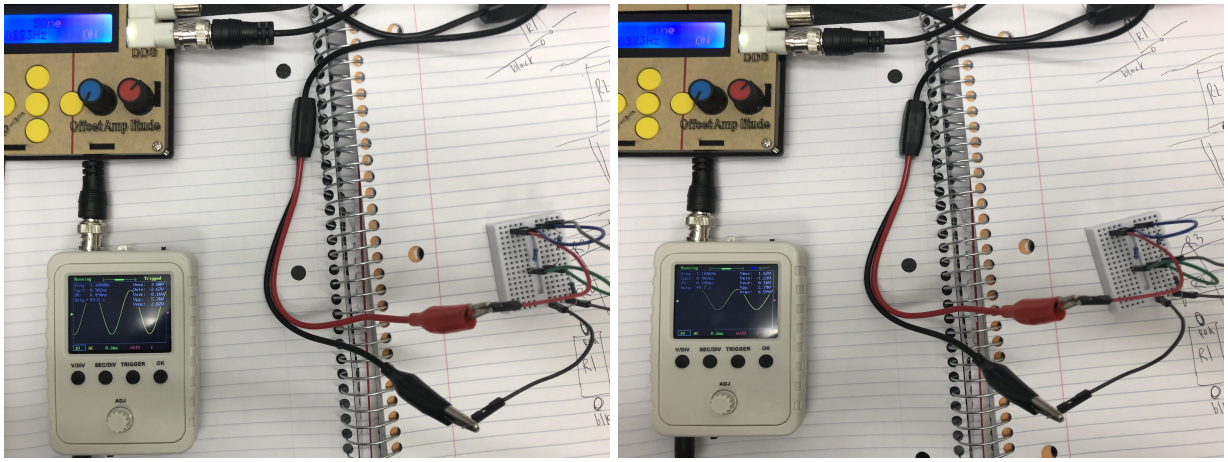
1. What did you expect to see, and did you see it? If not, why not. If so, how well (quantitatively) did it fit your expectation?

   - The $\frac{R_1}{R_1+R_2}$ and $\frac{V_1}{V_{12}}$ values are relatively the same with less than 10% difference proving that the voltage divider is directly proportional to the input voltage and the ratio of R_1 and R_2.

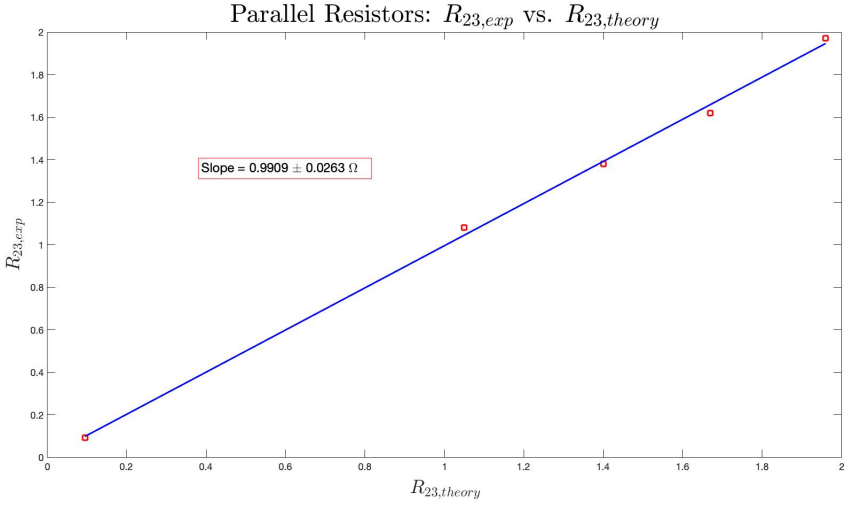
Part 2

Table 2: Parallel Resistors									
R_1	R_2	R_3	V_1	V/DIV for V_1	$I_1 = I_{23}$	V_{123}	V_{23}	$R_{23,\text{expt}}$	$R_{23,\text{theory}}$
1k	2k	2.2k	0.97V	1V	0.97	2.02V	1.05V	1.08k	1.05k
1k	2k	100	1.85V	1V	1.85	2.02V	0.12V	91.9k	95.24Ω
1k	2k	4.7k	0.85V	1V	0.85V	2.02V	1.17V	1.38k	1.40k
1k	2k	10k	0.77V	1V	0.77	2.02V	1.25V	1.62k	1.67k
1k	2k	100k	0.68V	1V	0.68V	2.02V	1.34V	1.97k	1.96k

Picture 2



Graph 2



Discussion 2

1. What did you expect to see, and did you see it? If not, why not. If so, how well (quantitatively) did it fit your expectation?

    - The experimental and theoretical values are relatively the same with less than 10% difference proving that the voltage divider is directly proportional to the input voltage and the ratio of R_1 and R_{23}.