

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Phys 1102/1220 - Richmond Campus				DISCLAIMER: These example data are purposefully									
2	Experiment 9: DC Circuits				inaccurate. You may test your spreadsheet equations									
3	Your nam, Partner's Name				for correctness using these values, but your real									
4	Date				experimental values will be very different.									
5														
6	Part A: Series and Parallel Circuits													
7	DATA													
8	Resistance Measurements				Voltage Measurements				Current Measurements					
9	Resistor	R (Ω)	δR (Ω)	$\delta R/R$	Voltage	V (V)	δV (V)	$\delta V/V$	Current	I (mA)	δI (mA)	$\delta I/I$		
10	R1	400.8	1.6032	0.4%	Vtot	10.01	0.05005	0.5%	I1	26.204	0.26204	1.0%		
11	R2	1200	4.8	0.4%	V3	1.185	0.005925	0.5%	I5	10.945	0.10945	1.0%		
12	R3	111.6	0.4464	0.4%										
13	R4	152.5	0.61	0.4%										
14	R5	600	2.4	0.4%										
15	Req	241.1	0.9644	0.4%										
16														
17														
18	CALCULATIONS				Note: No uncert propagation, use % discrepancy to analyze results									
19	Equivalent Resistance				Calculated voltage				Calculated currents					
20	Resistor	R (Ω)	% discrepancy		Voltage	V (V)	% discrepancy		Current	I (mA)	% discrepancy			
21	Req	240.1600558	0.39%		V3	1.170327883	1.25%		I1	24.9750499	4.80%			
22									I5	10.48680899	4.28%			
23														
24	SUB-CALCS													
25	Equivalent Resistances				Calculated voltages				Calculated currents					
26	Resistor	R (Ω)			Voltage	V (V)			Current	I (mA)				
27	RA=R35	711.6			V1	10.01			I _{tot}	41.68053662				
28	RB=R235	446.7043315			V2	7.462413276			I2	6.21867773				
29	RC=R4235	599.2043315			V4	2.547586724			I3	10.48680899				
30					V5	6.292085393			I4	16.70548672				
31					VA	7.462413276			IA	10.48680899				
32					VB	7.462413276			IB	16.70548672				
33					VC	10.01			IC	16.70548672				

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2	Experiment 9: DC Circuits								
3	<i>Your name, Partner's Name</i>								
4	<i>Date</i>								
5									
6	Part B: Kirchoff's Rules								
7	DATA								
8	Resistance Measurements								
9	Resistor	R (Ω)	δR (Ω)	$\delta R/R$					
10	R6	1200	4.8	0.4%					
11	R7	870	3.48	0.4%					
12	R8	280.15	1.1206	0.4%					
13									
14	Current Measurements					Voltage Measurements			
15	Current	I (mA)	δI (mA)	$\delta I/I$		Voltage	V (V)	δV (V)	$\delta V/V$
16	I6	1.941	0.01941	1.0%		E1	3.0011	0.0150055	0.5%
17	I7	0.647	0.00647	1.0%		E2	1.251	0.006255	0.5%
18	I8	2.612	0.02612	1.0%		Vbe	0.7202	0.003601	0.5%
19									
20	CALCULATIONS			Note: No uncert propagation, use % discrepancy to analyze results					
21	Calculated Currents					Calculated Voltage			
22	Current	I (mA)	% discrepancy			Voltage	V (V)	% discrepancy	
23	I6	1.909740417	1.62%			Vbe	0.7094115	1.51%	
24	I7	0.622515517	3.86%						
25	I8	2.532255934	3.10%						
26									
27	<u>Current Sub-Calcs Using Matrix Algebra</u>								
28	Current Coefficient Matrix, M								
29	I6	I7	I8	=					
30	1200	-870	0	1.7501					
31	0	870	280.15	1.251					
32	1	1	-1	0					
33									
34	Inverse Coefficient Matrix, M ⁻¹			Currents (A)					
35	0.000708259	0.000535744	0.150088629	0.00190974					
36	-0.000172516	0.000738957	0.207018798	0.000622516					
37	0.000535744	0.001274701	-0.642892573	0.002532256					