

Lab 1 - Results: Intro to DC Circuits

ECE209: *Fundamentals of Electrical Engineering*

Name	Student ID	CCID	Lab Section

Pre-lab Sign-off: _____ Results Sign-off: _____

Equipment Familiarization

Student PC Board - Resistors

RESISTORS A - (4-band Resistors)							
Resistor	1.8k		4.7k		62k		4.7M
Color 1							
Color 2							
Color 3							
Color 4							
Tolerance							
High/low R Value (Ω)							
Resistance (Ω)							
% Error							

RESISTORS B - (5-band Resistors)							
Resistor	1.00k		20.0k		40.2k		200k
Color 1							
Color 2							
Color 3							
Color 4							
Color 5							
Tolerance							
High/low R Value (Ω)							
Resistance (Ω)							
% Error							

Series Resistors				
Resistors	1.8k + 4.7k	4.99k + 40.2k	20.0k + 200k	5.6k + 10.0k + 20.0k
Calculated R (Ω)				
Resistance (Ω)				

Parallel Resistors				
Resistors	1.8k // 4.7k	4.99k // 40.2k	20.0k // 200k	5.6k // 10.0k // 20.0k
Calculated R (Ω)				
Resistance (Ω)				

DC Power Supply and Digital Multimeter

Power Supply as a Voltage Source			
Needle	5V	10V	20V
Voltage (V)			
% Error			

Power Supply as a Current Source			
Needle	100mA	200mA	300mA
Current (mA)			
% Error			

Power Supply as a Series Voltage Source			
Needle	2.5V	5V	10V
Voltage (V)			

Power Supply as a Parallel Current Source			
Needle	100mA	200mA	400mA
Current (mA)			

Decade Box

Setting	1k	5k	12k	38k
Resistance (Ω)				

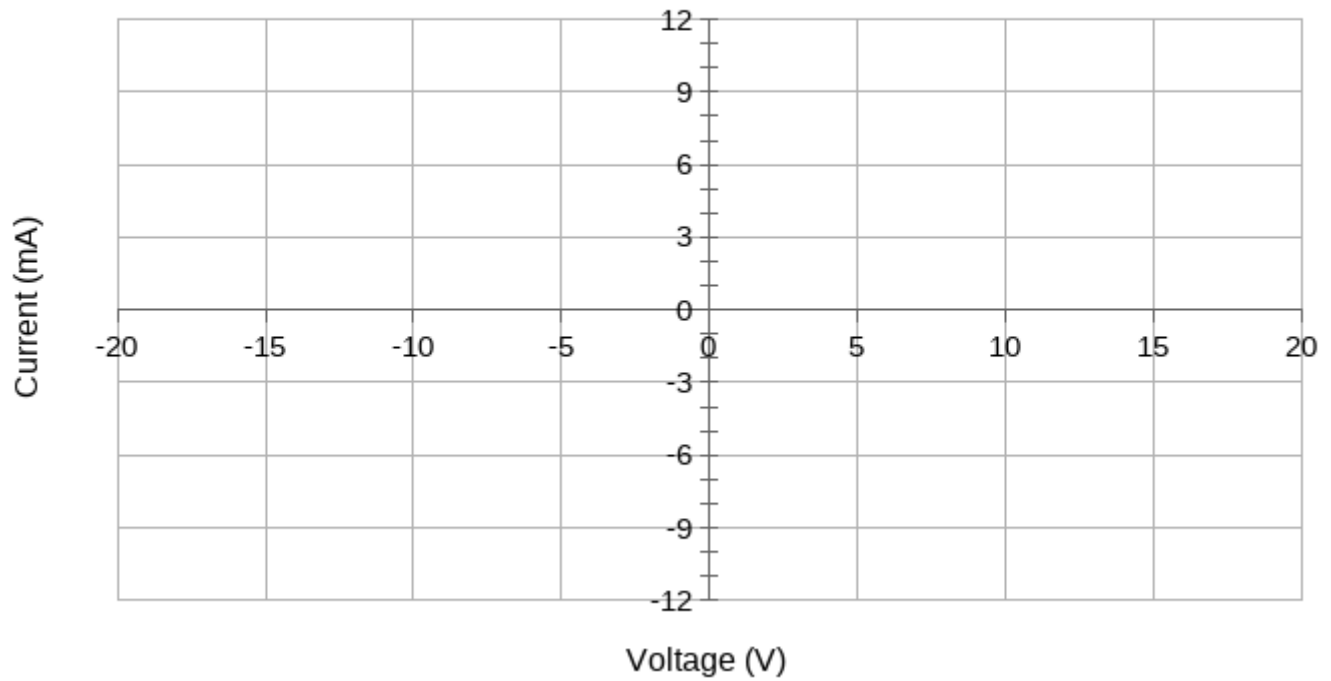
Ohm's Law and Power Dissipation

1.8k						
Needle	20V	10V	5V	-5V	-10V	-20V
Current (mA)						
Resistance (Ω)						
Power (mW)						

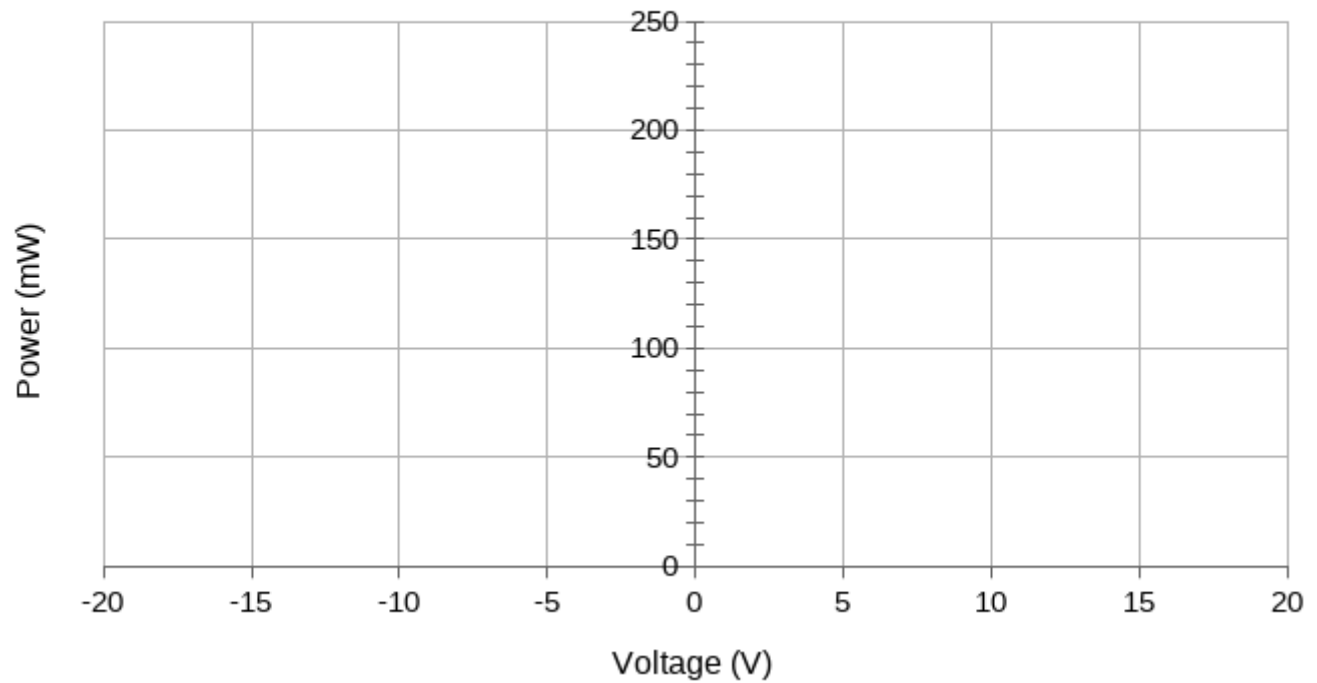
4.7k						
Needle	20V	10V	5V	-5V	-10V	-20V
Current (mA)						
Resistance (Ω)						
Power (mW)						

20.0k						
Needle	20V	10V	5V	-5V	-10V	-20V
Current (mA)						
Resistance (Ω)						
Power (mW)						

Resistor I-V Curves



Resistor P-V Curves



Current Divider

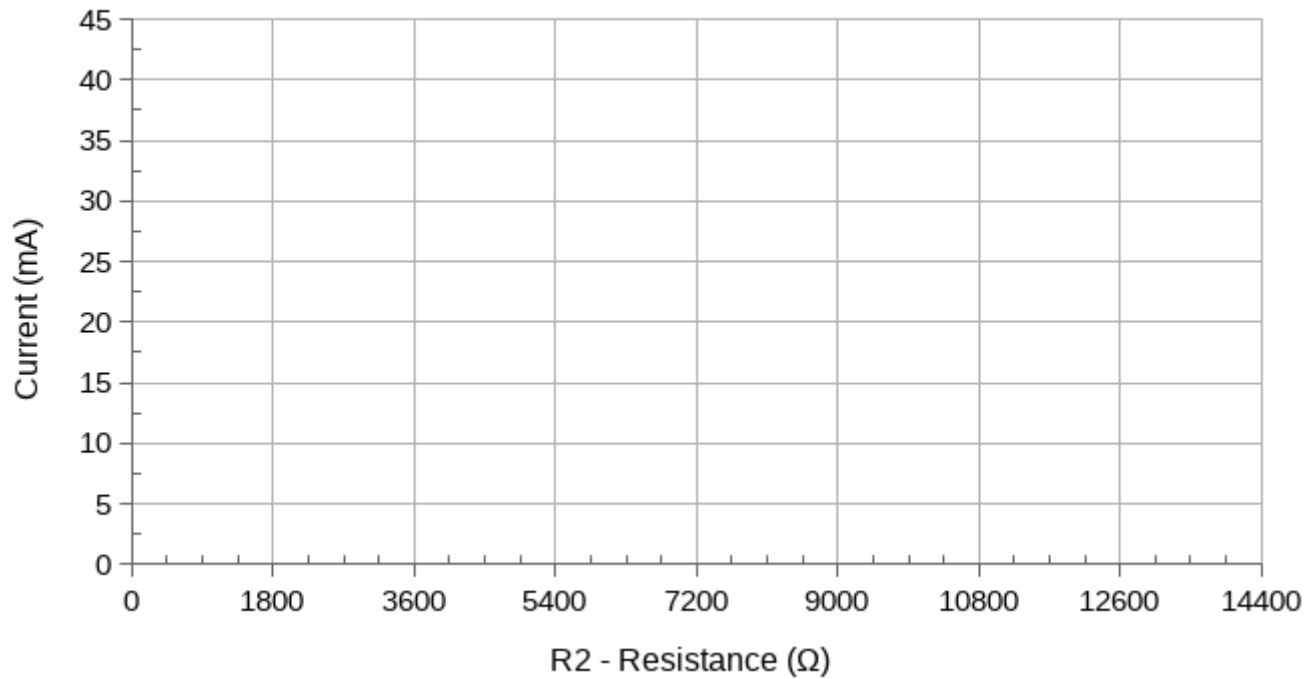
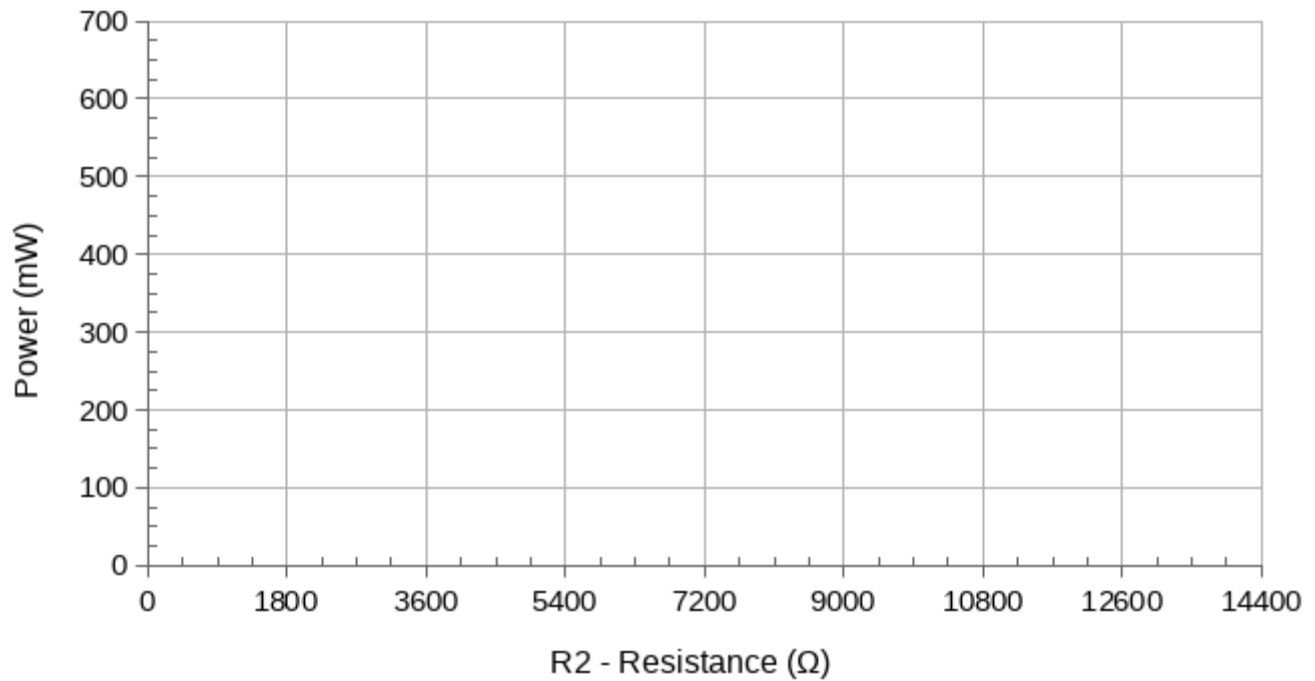
R_1	1.8k ($V_s = 15\text{ V}$)					
R_2	450	900	1.8k	3.6k	7.2k	14.4k
$R_1/R_2 (\Omega)$						
$I_s (\text{mA})$						
$I_{R1} (\text{mA})$						
$I_{R2} (\text{mA})$						
$V_s (\text{V})$						
$I_s (\text{mA})$						
$I_{R1} (\text{mA})$						
$I_{R2} (\text{mA})$						
$P_{R1} (\text{mW})$						
$P_{R2} (\text{mW})$						
$P_{\text{TOTAL}} (\text{mW})$						

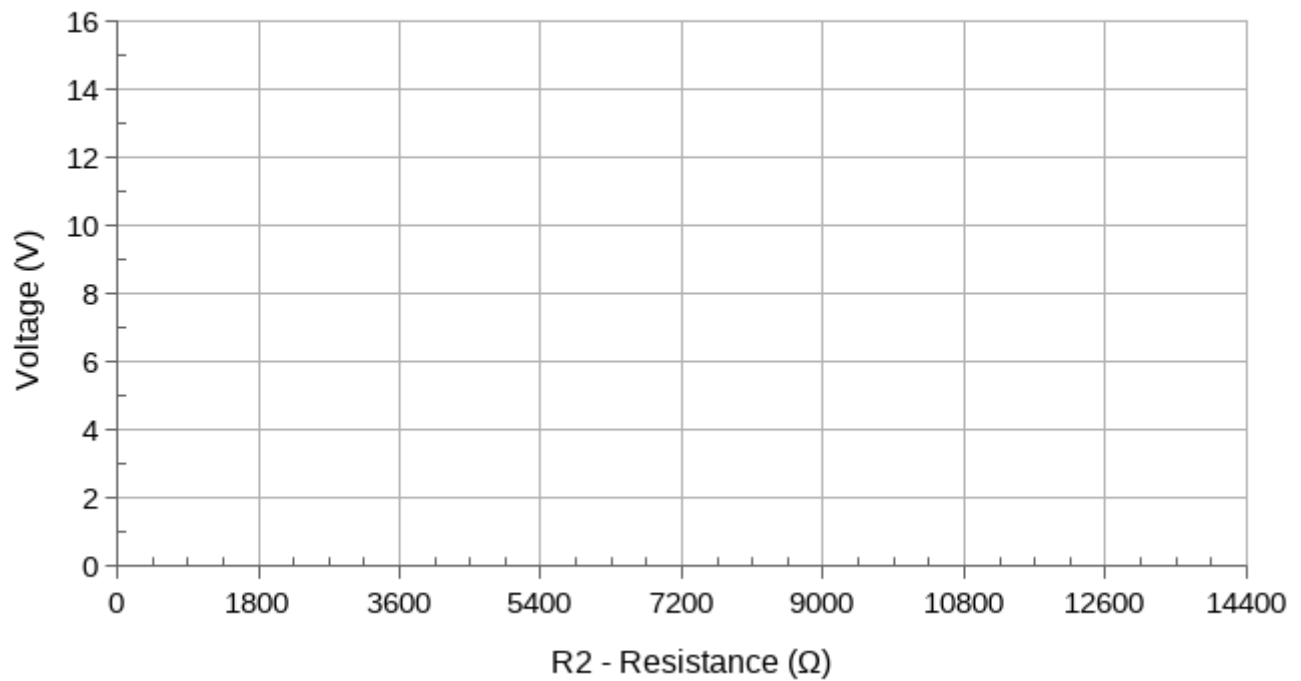
Voltage Divider

R_1	1.8k ($V_s = 15\text{ V}$)					
R_2	450	900	1.8k	3.6k	7.2k	14.4k
$R_1+R_2 (\Omega)$						
$I_s (\text{mA})$						
$V_{R1} (\text{V})$						
$V_{R2} (\text{V})$						
$V_s (\text{V})$						
$I_s (\text{mA})$						
$V_{R1} (\text{V})$						
$V_{R2} (\text{V})$						
$P_{R1} (\text{mW})$						
$P_{R2} (\text{mW})$						
$P_{\text{TOTAL}} (\text{mW})$						

The Loading Effect

	V_s	V_1	V_2
Calculated (V)			
Voltage (V)			
% Error			

Current Divider ($R_1 = 1.8k$) - CurrentCurrent Divider ($R_1 = 1.8k$) - Power

Voltage Divider ($R_1 = 1.8k$) - VoltageVoltage Divider ($R_1 = 1.8k$) - Power