

Name: _____

Lab Partner: _____

Survey of Physics

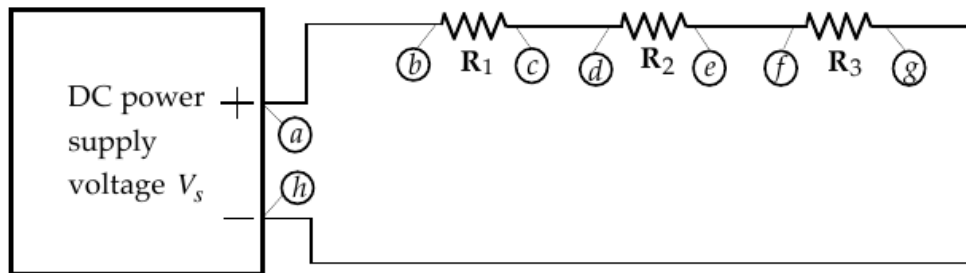
Lab 14: Resistor Networks

Purpose: You will make measurements of potential difference (voltage drop) and current for series resistors and parallel resistors in DC circuits. You will also calculate the power produced in each resistor.

Use digital multimeters for all voltage and current measurements. Although the power supplies have analog voltage and current dials on the front, these are not highly accurate and should not be used for numerical measurements.

Procedure: Three Resistors in Series

Connect all three resistors to the DC power supply as shown in the circuit diagram, then measure voltage and current as indicated in the tables.



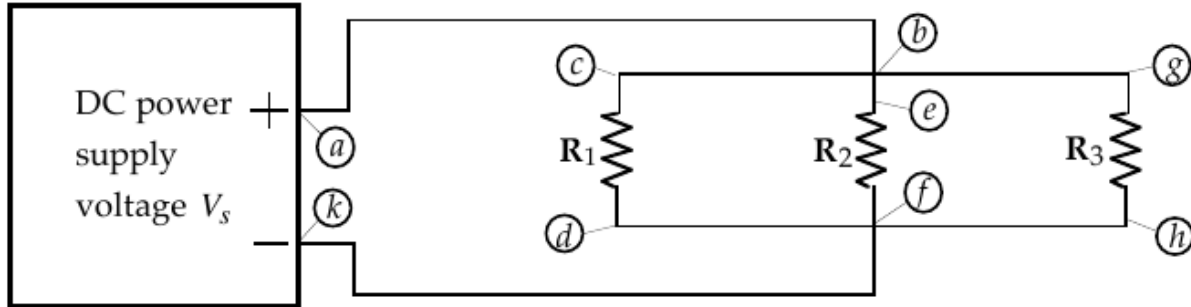
Voltage Measurements (volts)		
Power Supply V_s	V_{ah}	12.00 V
R_1 voltage drop	V_{bc}	
R_2 voltage drop	V_{de}	
R_3 voltage drop	V_{fg}	
Wiring voltage drops	V_{ab}	
	V_{cd}	
	V_{ef}	
	V_{gh}	

Current Measurements (amps)	
	$V_s = 12.00\text{ V}$
I_{ab}	
I_{cd}	
I_{ef}	
I_{gh}	

1. Calculate $V_{bc} + V_{de} + V_{fg}$. Compare this sum to V_s . What do you conclude?
2. Compare the current readings at each point in the circuit. What do you conclude?
3. Examine the wiring voltage drops. What do you conclude about the voltage drop across a copper wire carrying relatively small currents?

Three Resistors in Parallel:

Connect all three resistors to the DC power supply as shown in the circuit diagram, then measure voltage and current as indicated in the tables.



Voltage Measurements (volts)		
Power Supply V_s	V_{ak}	12.00 V
R_1 voltage drop	V_{cd}	
R_2 voltage drop	V_{ef}	
R_3 voltage drop	V_{gh}	

Current Measurements (amps)	
	$V_s = 12.00\text{ V}$
I_{ab}	
I_{bc}	
I_{be}	
I_{bg}	
I_{fk}	

1. Compare the voltage measurements for the parallel resistor circuit. What do you conclude about the voltages across resistors in parallel?
2. Calculate $I_{bc} + I_{be} + I_{bg}$. Compare this sum to I_{ab} and I_{fk} . What do you conclude?