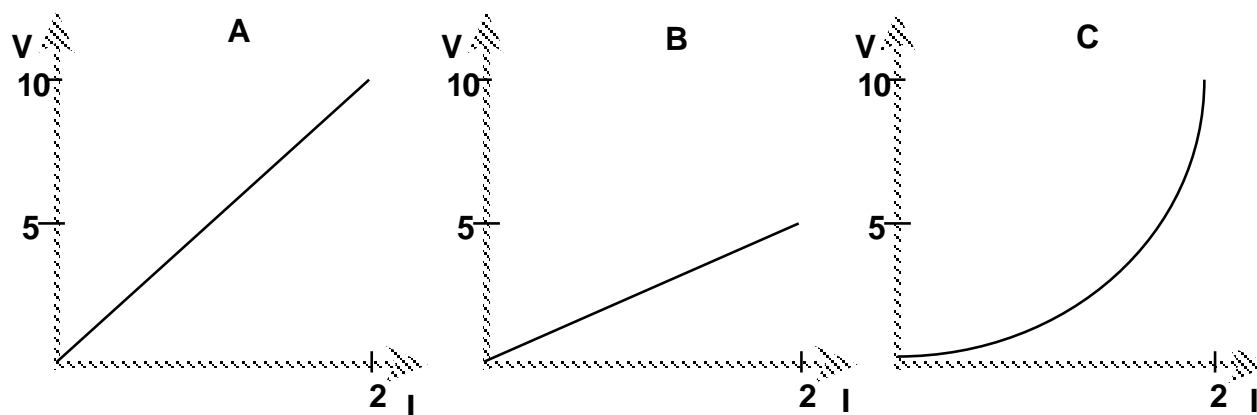


AP E&M - Worksheet 4

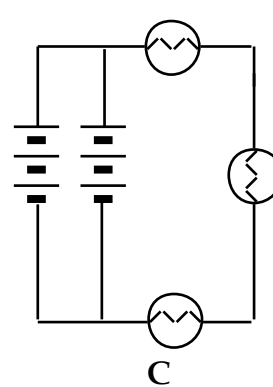
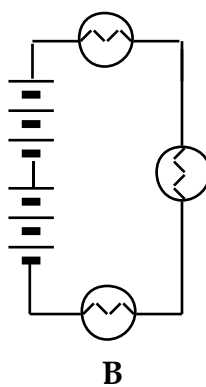
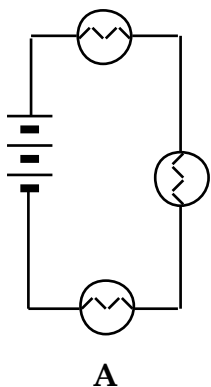
1. The following graphs represent data collected for three resistors.



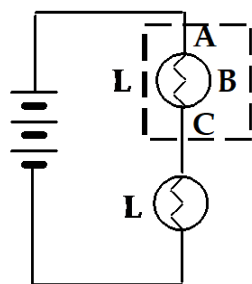
- Which graph(s) represent "ohmic" resistors? Explain.
- What potential difference exists across resistor A when 1.0 amps flow through it?
- What is the resistance (in ohms) of resistor B?

In the problems that follow, each cell in a battery provides a potential difference of 1.5 V.

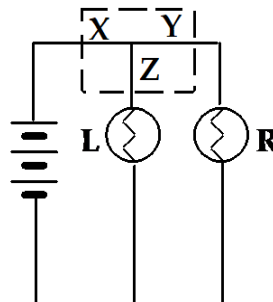
2. In each of the circuits below, all the bulbs are identical. Write what you would expect the voltage drop across each bulb to be.



3. In each of the diagrams below, consider the part of the circuit in the dashed box.
- a. How do the flow rates in A, B and C compare to each other?

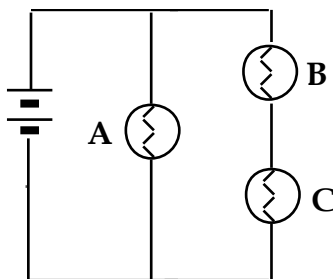


A = entering the bulb
B = through the bulb
C = leaving the bulb



X = entering the junction
Y = to R bulb from junction
Z = to L bulb from junction

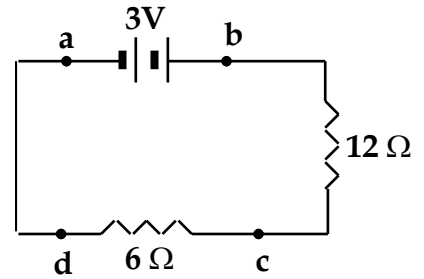
- b. How does the potential at A, B and C compare to each other? Explain.
- c. How do the flow rates in X, Y and Z compare to each other?
- d. How does the potential at X, Y and Z compare to each other? Explain.
4. In the circuit below all the bulbs have identical resistance. What is the voltage drop across each bulb? Sketch the charge density in each of the wires.



5. In the circuit above, how does the flow rate through A compare to that through B? How many times brighter should A be compared to B? Explain.

6. Consider the series circuit at right.

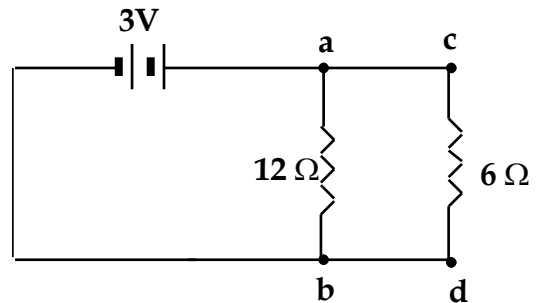
- a. What is the ΔV between:
- a and b
 - b and c
 - c and d
 - d and a



- b. What is the current in this circuit?
- c. What power is dissipated by each resistor?

7. Consider the parallel circuit at right.

- a. Determine the equivalent resistance of the circuit.
- b. What is the ΔV between:
- a and b
 - c and d



- c. What is the current in the wire leading from the battery to point **a**? in each of the branches?
- d. How much power is dissipated by each resistor?