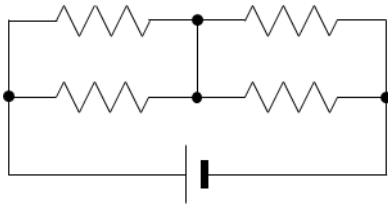


Resistors wired in series and parallel

Consider resistors wired in series and in parallel. In each case, is the current through each resistor, the voltage across each resistor, and the power consumed by each resistor the same or additive?

Redraw the circuit below to emphasize the series and parallel wiring between the resistors.



Internal resistance

What is internal resistance? How does it affect the voltage provided by a device such as a battery?

Does the terminal voltage of a battery depend on a quantity other than internal resistance?

Kirchhoff's rule

Describe the junction rule in your own words. Then, give a mathematical expression for the rule.

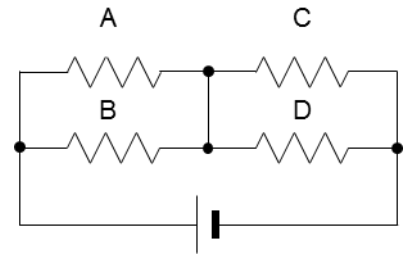
Describe the loop rule in your own words. Then, give a mathematical expression for the rule.

How do you decide which direction the current flows in a branch of a circuit?

When applying the loop rule, how do you decide whether a battery has a positive or negative potential difference? How do you decide for a resistor?

PH202-1G
 Spring 2014
 Problems

1. In the circuit shown below, the resistors have resistances $R_A = 2.0 \Omega$, $R_B = 7.0 \Omega$, $R_C = 4.0 \Omega$, and $R_D = 1.6 \Omega$. Find a) the equivalent resistance of the four resistors and b) the power consumed by each resistor if the battery provides a potential difference of 3.9 V.



2. Now, assume that the battery in the circuit in problem 1 has an internal resistance of 0.1Ω . Find a) the terminal voltage of the battery and b) the power consumed by each resistor.

3. Find the current direction and magnitude through each resistor in the circuit to the right.

