

Thursday Reading Assessment: Unit 2, Ohm's Law, Resistors in Complex Circuits

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1 Memory Bank

- $R_{tot} = R_1 + R_2 \dots$ Total resistance of two resistors in series.
- $R_{tot}^{-1} = R_1^{-1} + R_2^{-1} \dots$ Total resistance of two resistors in parallel.
- $P = IV \dots$ The power consumed by a device that draws a current I at a voltage V .
- $\Delta Q = I\Delta t \dots$ The definition of current implies that a **charge** is a current multiplied by a time.

2 Current from Resistance and Voltage

1. (a) Suppose an electrical circuit is comprised of a 5V battery, and two $1\text{k}\Omega$ resistors *in series*. What is the current flowing from the battery? (b) Suppose an electrical circuit is comprised of a 5V battery, and two $1\text{k}\Omega$ resistors *in parallel*. What is the current flowing from the battery? (c) Compute the power consumption for the circuits in parts (a) and (b). (d) If the battery has 10 A hr of charge, how long will the battery last in each case?

3 Kirchhoff's Rules

1. Consider the circuit in Fig. 1. How long will the battery power the circuit?

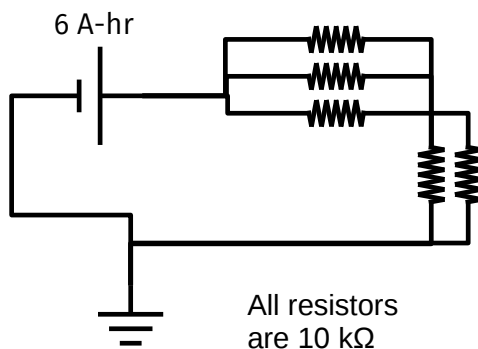


Figure 1: A circuit with 5 resistors, each with $R = 10\text{ k}\Omega$.