

Series Circuits Practice

Circle Answers with units. Show all Work.

Remember, for resistors in series:

The voltage drops across each resistor (voltage is shared in the circuit).

The sum of the voltage equals the voltage of the battery.

The **current is the same at all points** in the circuit.

The sum of the resistance is found by adding all the resistors together.

1. A $30\ \Omega$ resistor and a $14\ \Omega$ lamp are connected in series with a switch to a $60\ \text{V}$ battery.
 - a. Draw the schematic diagram of this circuit.
 - b. What is the total resistance of the circuit?
 - c. What is the current in the circuit?
 - d. What is the voltage drop **across each resistor?**
 - e. How much power is used by **each resistor?**
 - f. How much power is used by the entire circuit?

2. A $12\ \Omega$ motor and a $17\ \Omega$ resistor and a $9\ \Omega$ motor are connected in series to a $75\ \text{V}$ battery.
 - a. Draw the schematic diagram of this circuit.
 - b. What is the total resistance of the circuit?
 - c. What is the current moving through the first resistor?
 - d. What is the potential difference **across each resistor?**
 - e. How much power is used by **each resistor?**
 - f. What is the power dissipated by the circuit?

3. Three $20\ \Omega$ lamps and a $14\ \Omega$ resistor are connected in series with a switch to a $120\ \text{V}$ generator.
 - a. Draw the schematic diagram of this circuit.
 - b. What is the equivalent resistance of the circuit?
 - c. What is the current in the circuit?
 - d. What is the voltage drop **across each resistor?**
 - e. How much power is used by **each resistor?**
 - f. What is the power dissipated by the circuit?

4. A $10\ \Omega$ resistor, a $15\ \Omega$ lamp, and a $5\ \Omega$ motor are connected in series with a switch to a $90\ \text{V}$ battery.
 - a. Draw the schematic diagram of this circuit.
 - b. What is the equivalent resistance of the circuit?
 - c. What is the current moving through the second resistor?
 - d. What is the potential difference **across each resistor?**
 - e. How much power is used by **each resistor?**
 - f. How much power is used by the entire circuit?