

Series Circuits

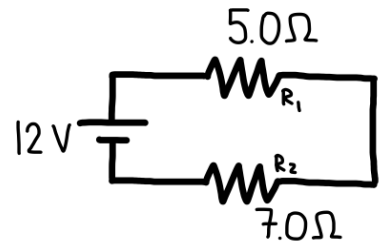
For **each resistor**, determine:
the current through the resistor
the voltage drop across the resistor
the resistance of each resistor

For the **entire circuit**, determine:
the total resistance
the total voltage of the circuit
the total current supplied by the battery

- 1) A **12.0 V DC battery** is connected in series with two resistors, as shown in the diagram:

- Resistor $R_1 = 5.0 \Omega$
- Resistor $R_2 = 7.0 \Omega$

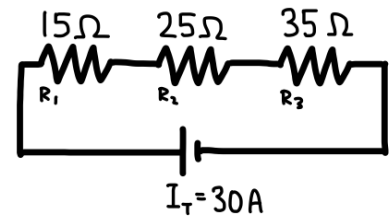
Assume all components are ideal and connecting wires have negligible resistance.



- 2) A series circuit consists of **three resistors** connected to a DC power source, as shown in the diagram:

- $R_1 = 15 \Omega$
- $R_2 = 25 \Omega$
- $R_3 = 35 \Omega$

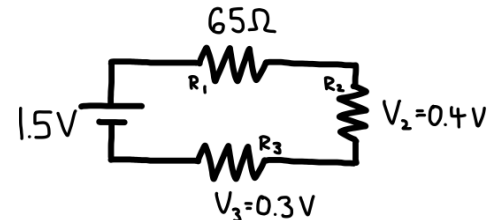
The **total current supplied by the source** is $I_{\text{total}} = 30 \text{ A}$. Assume all components are ideal and connecting wires have negligible resistance.



- 3) A **1.5 V DC battery** is connected in series with **three resistors**, as shown in the circuit diagram. The following information is known:

- $R_1 = 65 \Omega$
- The voltage drop across R_2 is $V_2 = 0.40 \text{ V}$
- The voltage drop across R_3 is $V_3 = 0.30 \text{ V}$

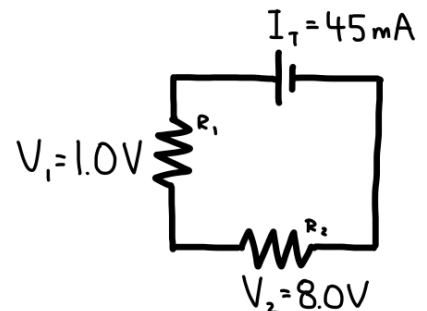
Assume all components are ideal and the resistance of connecting wires is negligible.



- 4) A series circuit consists of **two resistors**, R_1 and R_2 , connected to a DC power source, as shown in the diagram. The following information is known:

- The **total current** in the circuit is $I_{\text{total}} = 45 \text{ mA}$
- The **voltage drop across R_1** is $V_1 = 1.0 \text{ V}$
- The **voltage drop across R_2** is $V_2 = 8.0 \text{ V}$

Assume all components are ideal and the resistance of the connecting wires is negligible.

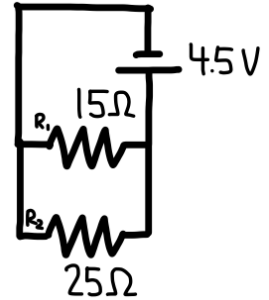


Parallel Circuits

- 5) A **4.5 V DC battery** is connected to **two resistors in parallel**, as shown in the diagram:

- $R_1 = 15\ \Omega$
- $R_2 = 25\ \Omega$

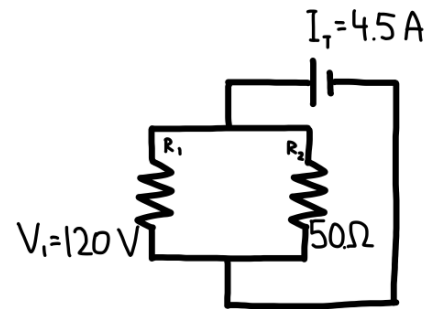
Assume all components are ideal and the resistance of the connecting wires is negligible.



- 6) A DC power source is connected to **two resistors in parallel**, as shown in the circuit diagram. The following information is known:

- The **total current** supplied by the source is $I_{\text{total}} = 4.5\ \text{A}$
- The **voltage across** R_1 is $V_1 = 120\ \text{V}$
- The resistance of the second resistor is $R_2 = 50\ \Omega$

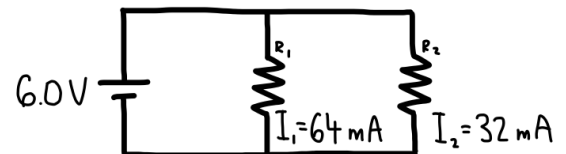
Assume all components are ideal and the resistance of the connecting wires is negligible.



- 7) A **6.0 V DC battery** is connected to **two resistors in parallel**, as shown in the circuit diagram. The following information is known:

- The current through resistor R_1 is $I_1 = 64\ \text{mA}$
- The current through resistor R_2 is $I_2 = 32\ \text{mA}$

Assume all components are ideal and the resistance of the connecting wires is negligible.



- 8) A **9.0 V DC battery** is connected to **three resistors in parallel**, as shown in the circuit diagram:

- $R_1 = 2.0\ \Omega$
- $R_2 = 4.0\ \Omega$
- $R_3 = 6.0\ \Omega$

Assume all components are ideal and that the resistance of the connecting wires is negligible.

