

Physics 10
Series Circuits and Drawings

Circuit Drawings

1. Draw a circuit with a 12 V battery, a 15 A fuse and (3) 4 Ω resistors in series.
Add an ammeter in series and a voltmeter across one of the resistors.
2. Draw a circuit with a 6 V voltage source and (3) 4 Ω resistors wired in parallel.
Add an ammeter on the branch of the first resistor and a voltmeter across the third resistor.
3. Draw a household circuit with two 60 W appliances in series and then two 75 W appliances in series, but in parallel with the two 60 W appliances.

Series Circuit Problems (on a separate sheet of paper):

4. A 12.0 V storage battery is connected to three resistors, 6.75 Ω , 15.3 Ω , and 21.6 Ω , respectively. The resistors are joined in series.
 - a. Draw a circuit diagram and add a closed switch and draw an ammeter in series.
 - b. Calculate the total (or equivalent) resistance.
 - c. What is the reading on the ammeter?

5. A 4.0 Ω resistor, an 8.0 Ω resistor, and a 12.0 Ω resistor are connected in series with a 24.0 V battery. Draw a voltmeter appropriately so that it will read the voltage across the 12.0 Ω resistor.
 - a. Calculate the equivalent resistance.
 - b. Calculate the current in the circuit.
 - c. What is the current in each resistor?
 - d. What is the potential difference (or voltage drop) across the 8.0 Ω resistor?
 - e. What is the reading on the voltmeter?

6. A 7.0 Ω resistor is connected in series with another resistor and a 4.5 V battery. The current in the circuit is 0.60 A. Calculate the value of the unknown resistance.

7. Draw a circuit diagram that contains a 5-Amp fuse, a 12 V battery, a 2.0 Ω and 4.0 Ω resistor wired in series.
 - a. What is the current in the circuit?
 - b. What is the potential difference across each of the resistors?
 - c. Will the fuse blow? Explain.