

10.5

CHECK YOUR Understanding

- Write the rules for determining the total voltage of resistors connected in series and in parallel in your own words.
- Four identical $22\ \Omega$ resistors are connected in series to a 9 V battery.
 - Draw a circuit diagram for this circuit.
 - What is the current going through each resistor?
 - What is the total resistance of this circuit?
- Two identical resistors are connected to a 120 V energy source in a parallel circuit. The energy source delivers 1.2 A , in total, to both resistors.
 - What is the voltage of each resistor?
 - What is the current in each resistor?
 - What is the resistance of each resistor?
 - What is the total resistance of the circuit?
- Two light bulbs are connected, with switches, to a 3 V energy source (Figure 10). When the switches are closed, both bulbs are lit. The current delivered by the voltage source to the circuit is 440 mA .

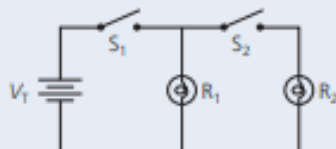


Figure 10

- The current in the first light bulb (R_1) is 160 mA . What is the current in the other light bulb?
 - Are the two light bulbs identical?
 - Determine the resistance of each light bulb and the total resistance.
 - If the second switch (S_2) is opened, what is the voltage across the second light bulb (R_2)? Explain your answer.
 - What is the voltage across the first light bulb? Explain your answer.
 - What current is delivered by the battery to the circuit?
- Three resistors, with values of $30\ \Omega$, $60\ \Omega$, and $90\ \Omega$, are connected in series. What is the total resistance of the three resistors?

- Copy Figure 11 into your notebook. Add the symbol for an ammeter or a voltmeter in the correct position to measure:
 - the voltage across R_2
 - the voltage across R_1 plus R_2
 - the total voltage (V_T) for the circuit
 - the current through R_3 only

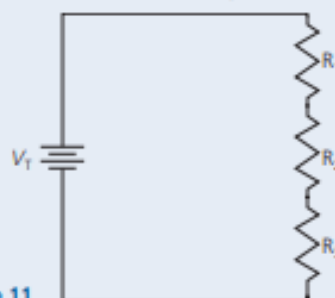


Figure 11

- Copy Figure 12 into your notebook. Add the symbol for an ammeter in the correct position to measure:
 - the current through R_1
 - the current through R_3
 - the current through R_2 and R_3

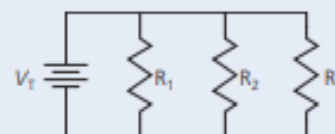


Figure 12

- Figure 13 shows a circuit that consists of three identical resistors. The total voltage (V_T) is 12 V .
 - What is the voltage of each resistor?
 - The current in the third resistor (R_3) is 500 mA . Determine the current in the first resistor (R_1).
 - What is the combined (total) resistance of the three resistors?

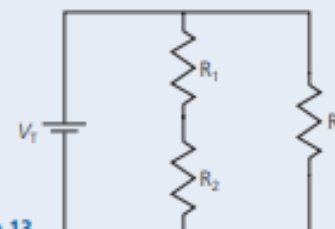


Figure 13