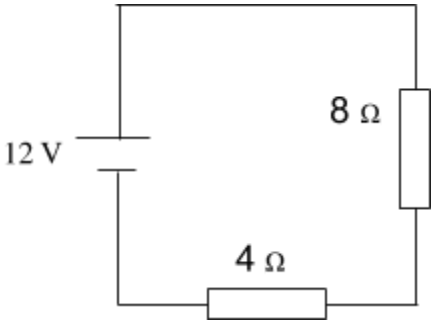
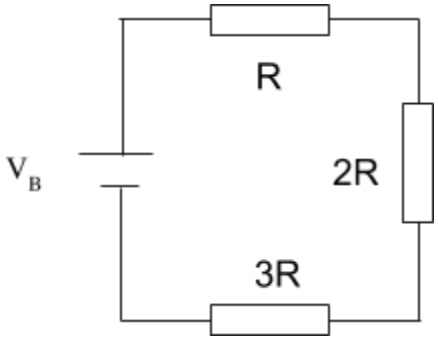
Series and Parallel

1. A circuit is set up as shown.

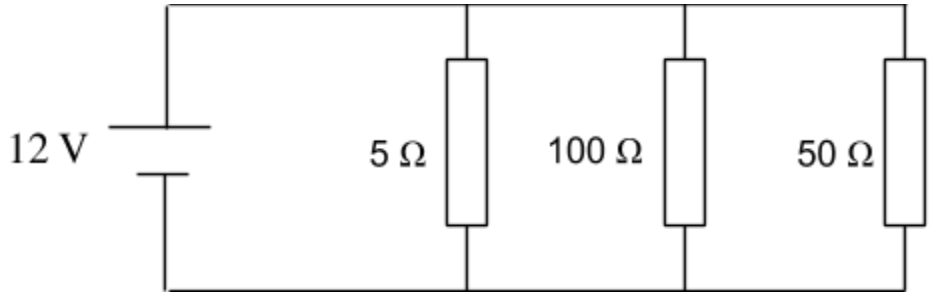


   a. Calculate the effective resistance of the circuit.
   b. Calculate the current through the 8 Ω resistor.
   c. Calculate the current through the 4 Ω resistor.
   d. Calculate the potential difference across each resistor.

2. Given the circuit shown with three resistors of R, 2R, and 3R connected to an ideal battery with a potential difference of V_B. Calculate the potential difference across each resistor.



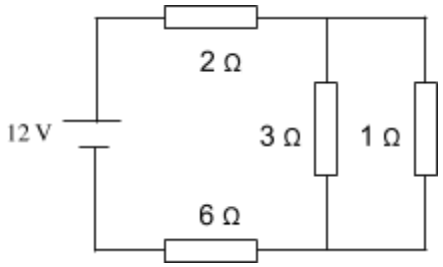
3. Consider this circuit.



   a. Calculate the effective resistance of the circuit.
   b. Calculate the current in each resistor.
   c. Predict the effect on the circuit if another 50 Ω resistor was added in parallel.

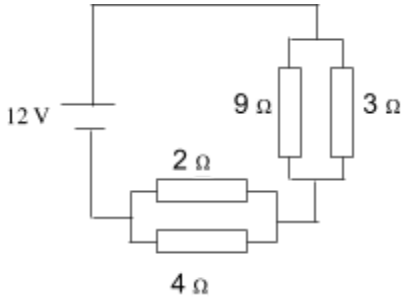
4. A circuit with three resistors of 5 Ω, 6 Ω, and 12 Ω is wired in parallel with an ideal battery with a potential difference of 12 V.
   a. Draw the circuit diagram.
   b. Calculate the current through each resistor.
   c. Calculate the current out of the battery.

5. Consider this circuit.



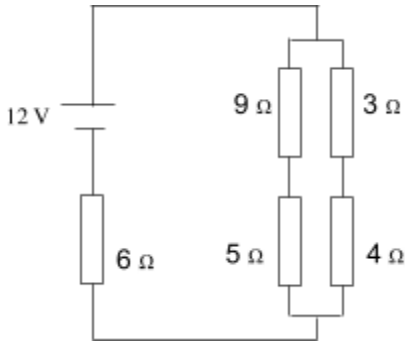
   a. Calculate the effective resistance of the circuit.
   b. Calculate the voltage across each resistor.
   c. Calculate the current through each resistor.
   d. Calculate the power dissipated by each resistor.
   e. Predict the effect on the circuit if the 3 Ω resistor was replaced with a 100 Ω resistor.
   f. Predict the effect on the circuit if the 6 Ω resistor was replaced with a 100 Ω resistor.

6. Consider this circuit.



   a. Calculate the effective resistance of the circuit.
   b. Calculate the voltage across each resistor.
   c. Calculate the current through each resistor.
   d. Calculate the power dissipated by each resistor.

7. Consider this circuit.



   a. Calculate the effective resistance of the circuit.
   b. Calculate the voltage across each resistor.
   c. Calculate the current through each resistor.
   d. Calculate the power dissipated by each resistor.
   e. Predict the effect on the circuit if the 3 Ω resistor was replaced with a 100 Ω resistor.
   f. Predict the effect on the circuit if the 6 Ω resistor was replaced with a 100 Ω resistor.