1. Calculate the energy, in kilowatt hours, required by a 60.0 W light bulb that operates for 4.0 h. (2 marks)

2. Calculate the amount of power required to charge a battery if 1400 J of energy is transferred in 5 min. (2 marks)

3. Calculate the electric potential difference between the negative and positive terminals of a battery if 1100 J of electric potential energy is transformed to move 100 C of charge between the terminals. (2 marks)

4. Three resistors are connected in parallel in a circuit. If the resistances are $R_1 = 3.1\ \Omega$, $R_2 = 8.2\ \Omega$, and $R_3 = 5.5\ \Omega$, calculate the equivalent resistance of the circuit. (2 marks)

5. Calculate the time required for 5 C of charge to pass through a resistor if the current is 950 mA. (2 marks)

6. Draw a circuit with a battery and **two** lamps in parallel. Use the correct symbols. (2 marks)

7. Calculate the total resistance in the following circuit if the resistor values are as follows: $R_1 = 8.1\ \Omega$, $R_2 = 14\ \Omega$, and $R_3 = 28.2\ \Omega$. (3 marks)

8. In the following circuit, the potential difference across the battery is 18 V. V_1 is 8.0 V and $R_2 = 32.0\ \Omega$. Calculate the values of R_1, V_2, and the current through the circuit. (3 marks)
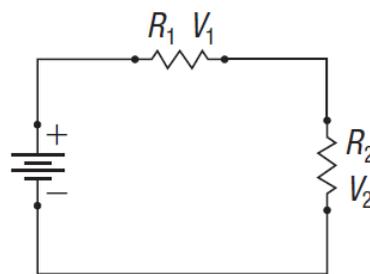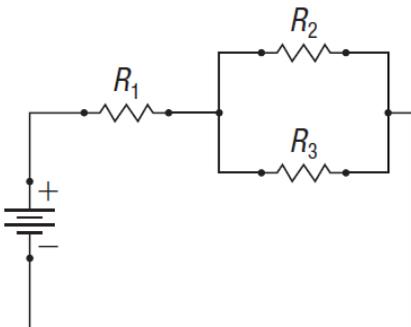
9. A washing machine is plugged into a 240 V source and uses 2.0 kWh of energy each load.
(a) How much total charge is moved through the machine for each load? (4 marks)

10. For the following circuit, $R_1 = 5.0\ \Omega$ and $R_2 = 50.0\ \Omega$. The potential difference across the battery is 20 V, and V_1 is 12 V. Calculate I_1, I_2, I_3, and R_3. (4 marks)

(b) If each load takes 35 min, how much power does the machine use? Answer in watts.

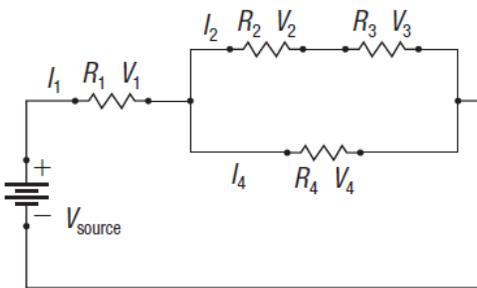(c) If each load takes 35 min, how much current does the machine draw? Answer in amperes.
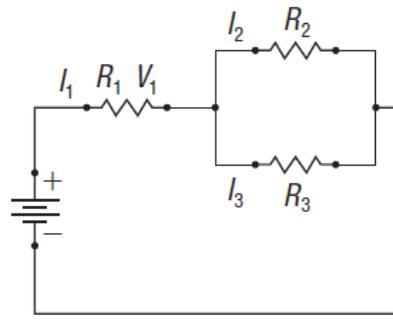
Answer question 11 OR 12, but not both.

11. In the following circuit, $V_1 = V_4$, $V_{source} = 50.0$ V, $R_1 = 100.0\ \Omega$, $R_2 = 2R_3$, $I_{source} = 0.250$ A, and $2I_2 = 3I_4$. (6 marks)

(a) What are the values of R_4, I_1, I_2, and I_4?
(b) What are the values of V_2 and V_3?

12 In the following circuit, $R_2 = 2R_3$, $R_1 = R_4$, $2R_1 = 5R_3$, $V_{source} = 34$ V, and $I_1 = 110$ mA. (6 marks)
(a) Find the values of R_1, R_2, R_3, and R_4.
(b) Find I.