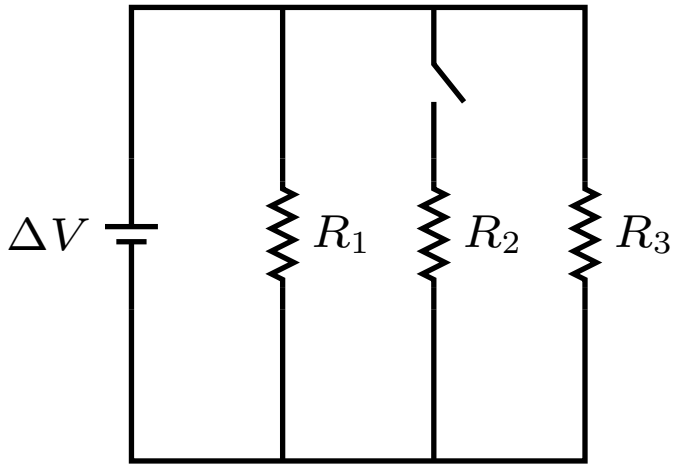
# Question 1

Consider the following circuit, where $R_1 = R_2 = R_3$.

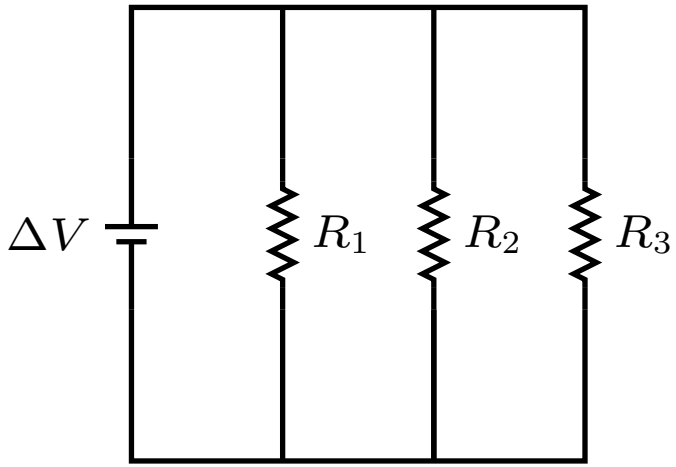



Consider the current through resistor 3 when the switch is open versus when it is closed.

1. $I_{\text{closed}} = \frac{2}{3} I_{\text{open}}$
2. $I_{\text{closed}} = I_{\text{open}}$
3. $I_{\text{closed}} = \frac{3}{2} I_{\text{open}}$

# Question 2

Consider the following circuit, where $R_1 = R_2 = 10\,\Omega$, $R_3 = 20\,\Omega$.

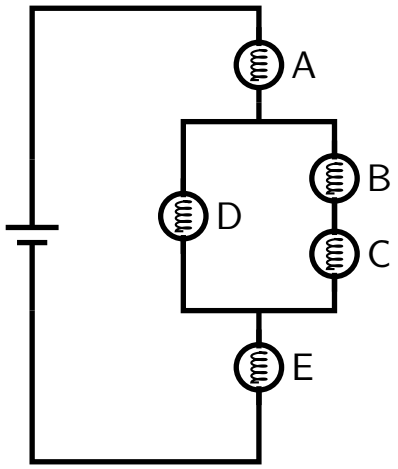



Which of the following is true of the equivalent resistance of the entire combination?

1. $R_{\text{eq}} = 40\,\Omega$
2. $20\,\Omega \leqslant R_{\text{eq}} < 40\,\Omega$
3. $10\,\Omega \leqslant R_{\text{eq}} < 20\,\Omega$
4. $R_{\text{eq}} = 10\,\Omega$
5. $R_{\text{eq}} < 10\,\Omega$

# Question 3

Several identical bulbs are connected in a circuit as illustrated.




Assume that the bulbs obey Ohm's law.

Which of the following statements about the powers produced by bulbs B versus D are true (choose one)?

1. $P_D = 4P_B$
2. $P_D = 2P_B$
3. $P_D = P_B$
4. $P_D = \frac{1}{2} P_B$
5. $P_D = \frac{1}{4} P_B$