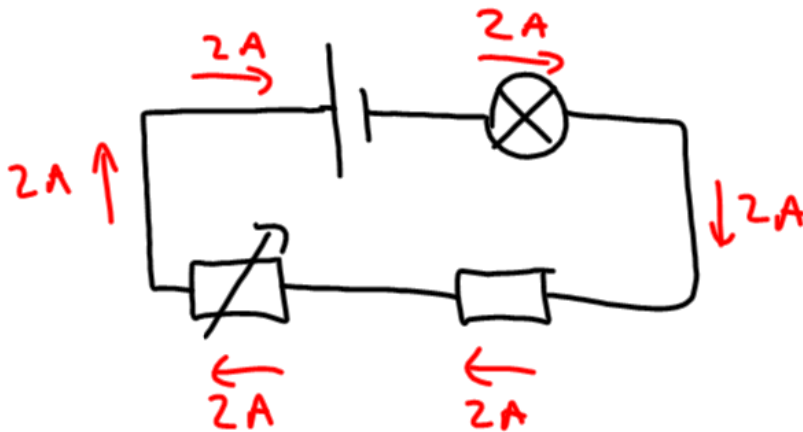
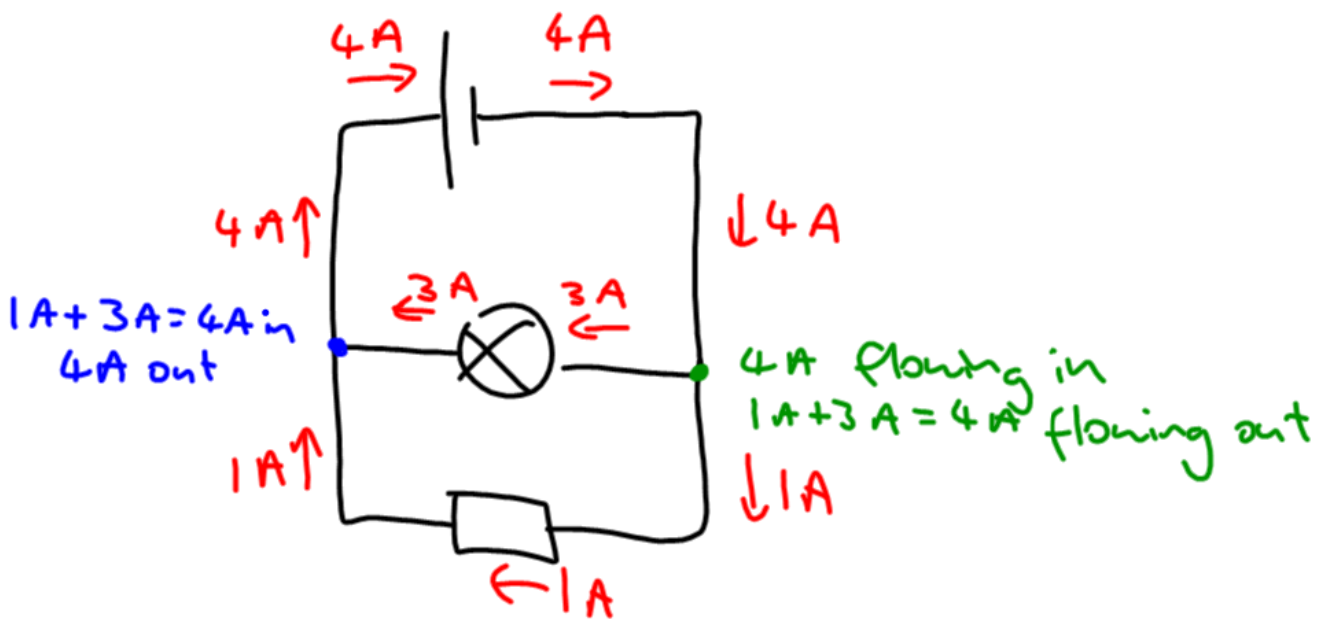


Circuit Rules

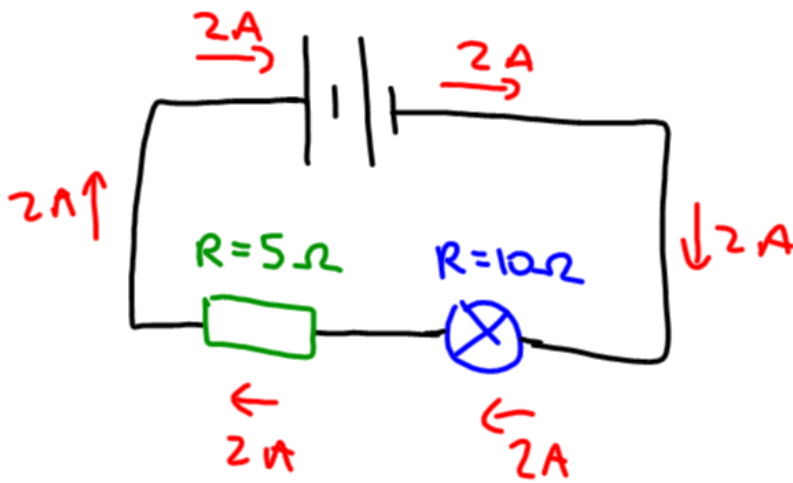
Rule 1. If there are no branches in a circuit (i.e. it is a series circuit) then the current is the same all through the circuit.




Rule 2. At a branch in a circuit, the total current flowing into the branch must equal the total current flowing out of the branch.




Rule 3. For any individual component, $V = IR$. Where V is the voltage across that particular component, I is the current through that particular component, and R is the resistance of that particular component.

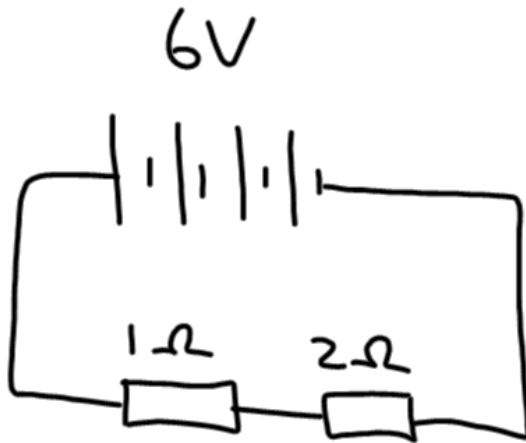


"What is the voltage across the resistor and the bulb?"

 $V = IR$
 $= 2A \times 5\Omega$
 $= 10V$

 $V = IR$
 $= 2A \times 10\Omega$
 $= 20V$

Rule 4. For a simple series circuit, you can also use $V = IR$ where V is the voltage of the cells, I is the current in the circuit (same everywhere) and R is the TOTAL resistance in the circuit.



"What is the current in this series circuit?"

$$V = IR \quad I = V/R$$

V across cells is 6V

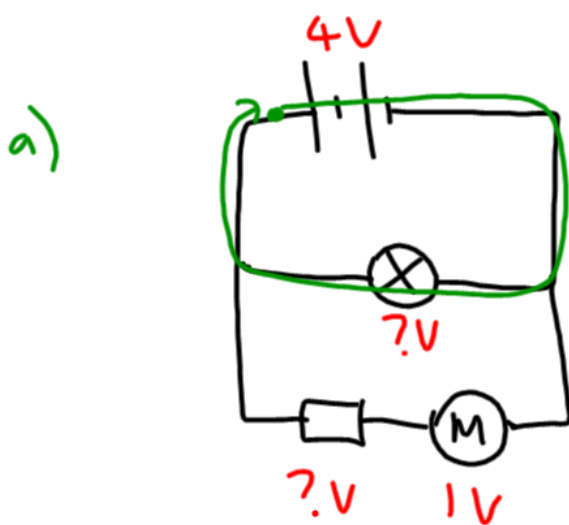
total R is $1\Omega + 2\Omega = 3\Omega$

so $I = \frac{6V}{3\Omega} = 2A$ (same everywhere because series)

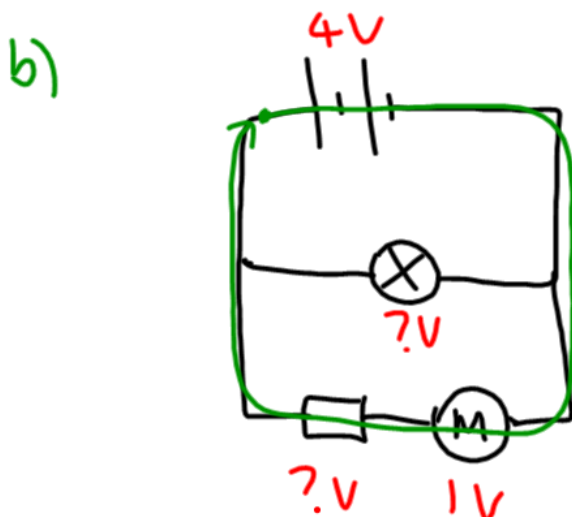
Rule 5. If you trace your finger around a closed loop in a circuit, the total voltage gained through any cells equals the total voltage lost through any components.



"What is the voltage across
a) the bulb
b) the resistor"



Closed loop with finger. Total V gained is 4V. So total V lost must be 4V. So V across bulb is 4V.



Total V gained is 4V. So total V lost is 4V. 1V is lost across motor, so 3V is lost across resistor.