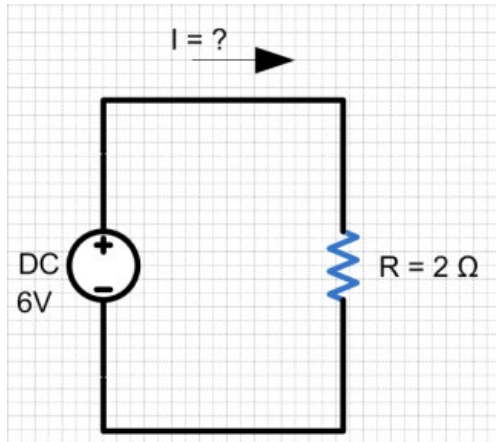


1. Find the current I through a resistor of resistance $R = 2\ \Omega$ if the voltage across the resistor is 6 V.



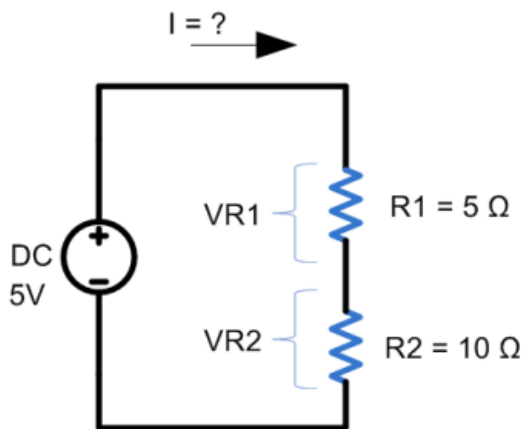
$$V = IR$$

Volts = Current * Resistance

$$\begin{aligned} \text{Volts} &= 6\text{ V} \\ \text{Resistance} &= 2\ \Omega \\ I &= ? \end{aligned}$$

$$\begin{aligned} I &= V/R \\ I &= 6\text{ V} / 2\ \Omega \\ \mathbf{I} &= \mathbf{3\text{ A}} \end{aligned}$$

2. In the circuit below resistors R_1 and R_2 are in series and have resistances of $5\ \Omega$ and $10\ \Omega$, respectively. The total voltage (V_T) is equal to 5 V. Find the current passing through the circuit and the voltage drop across R_1 and R_2 . Compute for the total voltage drop in the circuit.



$$\begin{aligned} R_T &= R_1 + R_2 \\ R_T &= 5\ \Omega + 10\ \Omega \\ R_T &= 15\ \Omega \end{aligned}$$

$$V = 5\text{ V}$$

$$I = ?$$

$$\begin{aligned} I &= V/R \\ I &= 5\text{ V} / 15\ \Omega \\ \mathbf{I} &= \mathbf{0.33\text{ A}} \end{aligned}$$

$$V = IR$$

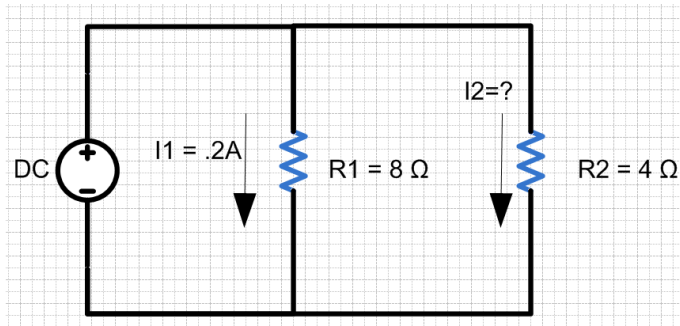
$$\begin{aligned} V_1 &= IR_1 \\ V_1 &= 0.33 (5\ \Omega) \\ \mathbf{V_1} &= \mathbf{1.65\text{ V (Voltage Drop)}} \end{aligned}$$

$$\begin{aligned} V_2 &= IR_2 \\ V_2 &= 0.33 (10\ \Omega) \\ \mathbf{V_2} &= \mathbf{3.3\text{ V (Voltage Drop)}} \end{aligned}$$

$$\begin{aligned} \text{Total Voltage drop} &= V_1 + V_2 \\ \text{Total Voltage drop} &= 1.65\text{ V} + 3.3\text{ V} \end{aligned}$$

$$\mathbf{\text{Total Voltage drop} = 4.95\text{ V (~5V)}}$$

3. In the circuit below resistors R1 and R2 are in parallel and have resistances of $8\ \Omega$ and $4\ \Omega$, respectively. The current passing through R1 is 0.2 A . Find the voltage across resistor R2 and the current passing through the same resistor.



$$V = IR$$

$$I_1 = 0.2\text{ A}$$

$$R_1 = 8\ \Omega$$

$$V_1 = I_1 \cdot R_1$$

$$V_1 = 0.2\text{ A} \cdot 8\ \Omega$$

$$\mathbf{V_1 = 1.6\text{ V}}$$

Since $V_1 = V_T$, then $\mathbf{V_2 \text{ and } V_T = 1.6\text{ V}}$

$$\mathbf{V_2 = 1.6\text{ V}}$$

$$I_2 = ?$$

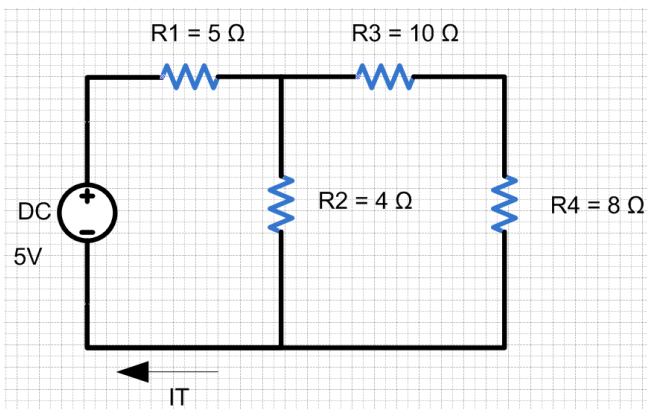
$$R_2 = 4\ \Omega$$

$$I_2 = V_2 / R_2$$

$$I_2 = 1.6\text{ V} / 4\ \Omega$$

$$\mathbf{I_2 = 0.4\text{ A}}$$

4. Find the total resistance R_T and total current I_T if the voltage source is 5 V .



Given:

$$R_1 = 5\ \Omega$$

$$R_2 = 4\ \Omega$$

$$R_3 = 10\ \Omega$$

$$R_4 = 8\ \Omega$$

$$R_3 + R_4 = 18\ \Omega$$

$$R_2 \parallel 18\ \Omega = (4\ \Omega \cdot 18\ \Omega) / (4\ \Omega + 18\ \Omega)$$

$$R_2 \parallel 18\ \Omega = (72\ \Omega) / (22\ \Omega)$$

$$R_2 \parallel 18\ \Omega = 3.27\ \Omega$$

$$R_T = R_1 + 3.27\ \Omega$$

$$R_T = 5\ \Omega + 3.27\ \Omega$$

$$\mathbf{R_T = 8.27\ \Omega}$$

$$I_T = ?$$

$$I_T = V_T / R_T$$

$$I_T = 5\text{ V} / 8.27\ \Omega$$

$$\mathbf{I_T = 0.60\text{ A}}$$