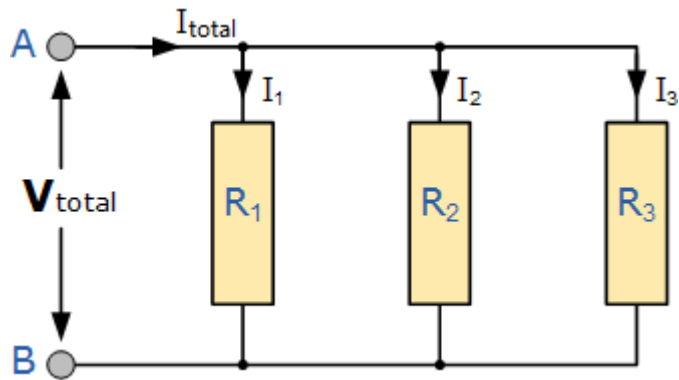


Physics Unit 3 - Electricity

When resistors are connected in **parallel**:

Equations and laws:



$$V_{\text{total}} = V_1 = V_2 = V_3$$

(The **voltages** across each resistor are the **same** when they are parallel)

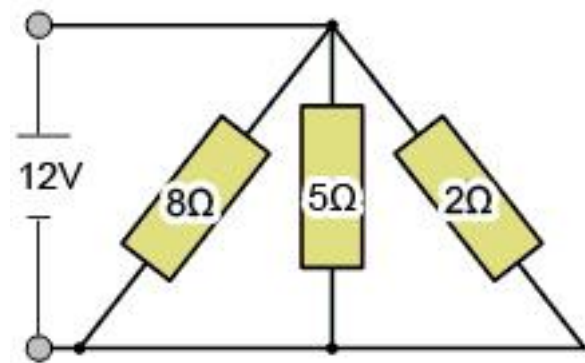
$$I_{\text{total}} = I_1 + I_2 + I_3$$

(The **currents** across each resistor are **different** depending on the resistance of each resistor when they are parallel)

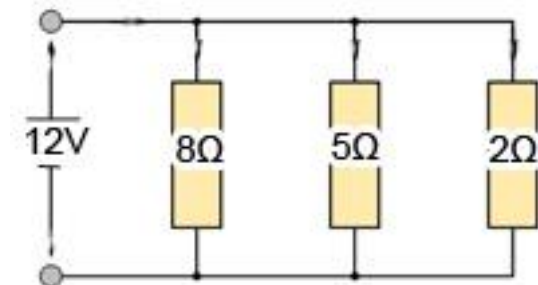
$$R_{\text{total}} = \frac{1}{\left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}\right)}$$

Example 1:

Calculate the current across each resistor.



Step 1: redraw the diagram. (Note: the modification at the top will not change the potential difference across each resistor.)



Step 2: calculate the current across each resistor.

For the 8 Ω resistor:

Voltage across it is: 12Volts, thus: $V=12$

Use $V=IR$ to calculate the current.

$$V=IR$$

$$12 = I \times 8$$

$$I = \frac{12}{8} = \mathbf{1.5A}$$