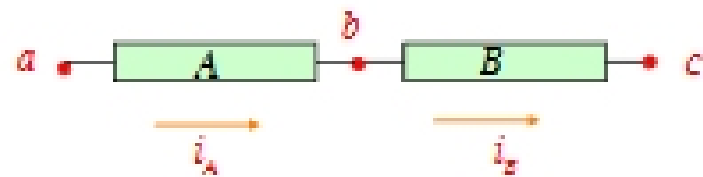


### Connecting Circuit Elements

#### a) Series Connection:



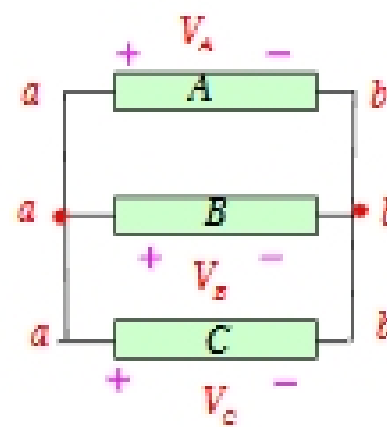
The two elements share a common node  
(no other elements connected to the same node)

The current in the two element is the same

$$i_A = i_B$$

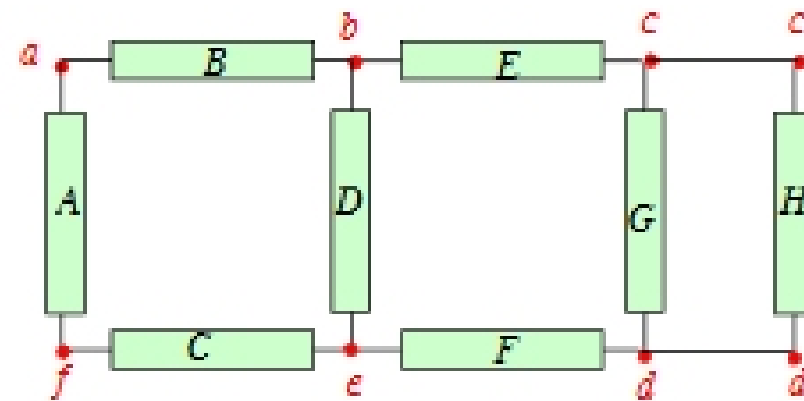
#### b) Parallel Connection:

Two or more elements are connected in parallel if they are connected between the same two nodes



$$V_A = V_B = V_C$$

The voltage across elements in parallel is the same.



Elements in series: C & A & B

Elements in Parallel G & H

### Simple Resistive Circuits

Define the voltage across and the current through every element in the circuit

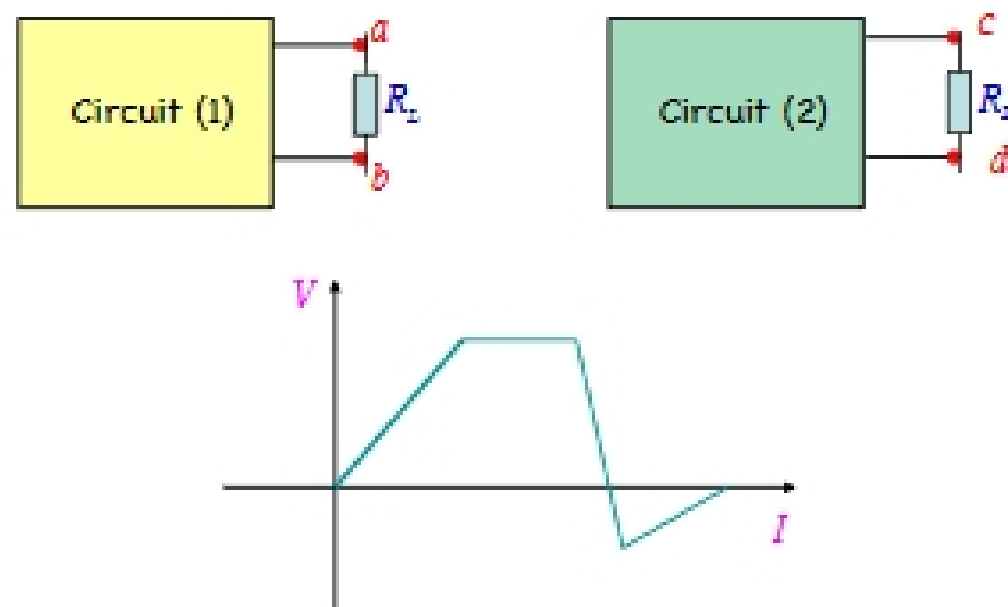
#### Different techniques of circuit analysis:

- Circuit Reduction technique.
- Node voltage method.
- Mesh current method.

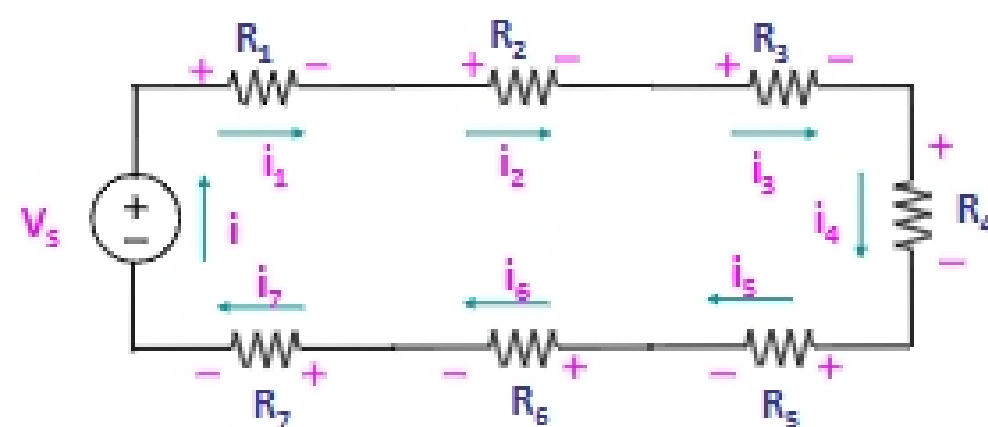
### Circuit Reduction technique

#### Concept of equivalent circuits

Two circuits considered to be equivalent if the (i-v) relation between the terminals for the two circuits are exactly the same.



### Resistors in series



**KCL:**  $i_1 = i_2 = i_3 = i_4 = i_5 = i_6 = i_7 = i$

**KVL:**  $V_s - i(R_1) - i(R_2) - i(R_3) - i(R_4) - i(R_5) - i(R_6) - i(R_7) = 0$

$$V_s = i \{ (R_1) + (R_2) + (R_3) + (R_4) + (R_5) + (R_6) + (R_7) \}$$

$$V_s = i \{ R_{\text{eq}} \}$$