Branch, Node and Loop

- A branch represents a single element such as a voltage or current source or a resistor.
- A node is the point of interconnection between two or more branches.
- A loop is a closed path in a circuit.

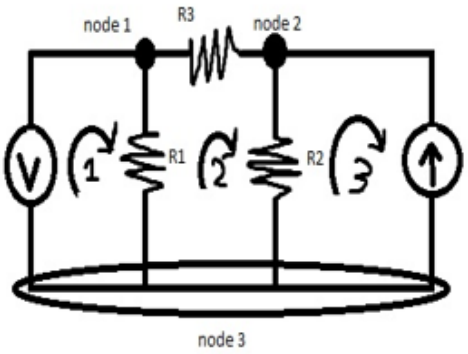


Fig: A circuit for Branch, Node and loop analysis

Short Circuit

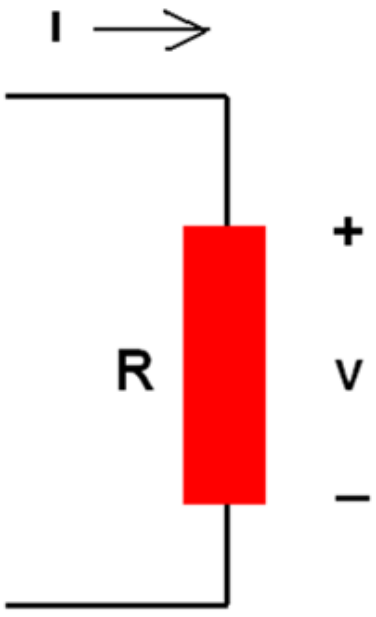
If the resistor is a perfect conductor (or a short circuit).

$R = 0\ \Omega$,

then

$v = IR = 0$ V

No matter how much current is flowing through the resistor



Open Circuit

If the resistor is a perfect insulator, R = ∞ Ω

Then no matter how much voltage is applied to (or dropped across) the resistor.