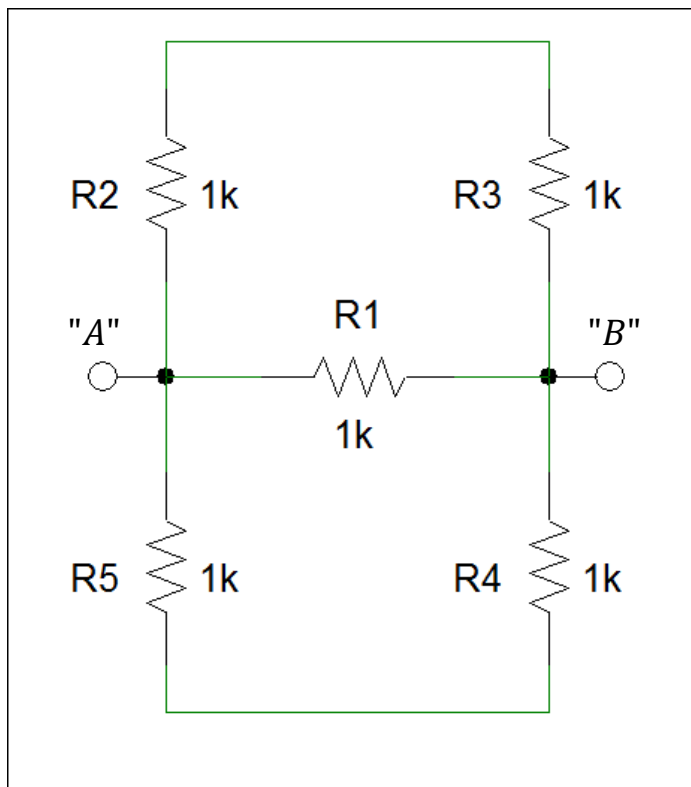# Total resistance of electric DC circuit

Total resistance of electrical circuit will be calculated. Total resistance is seen from terminals A i B. Before starting calculations types of connections between resistors will be analyzed.

Drawing 1. Electrical circuit.

Resistors $R2$ and $R3$ are connected in series. They will be replaced with resistance $R23$.

$$R23 = R2 + R3$$

$$R23 = 1000 + 1000$$

$$R23 = 2000[\Omega]$$

$$R23 = 2[k\Omega]$$

Resistors $R4$ and $R5$ are connected in series. They will be replaced with resistance $R45$.

$$R45 = R4 + R5$$

$$R45 = 1000 + 1000$$

$$R45 = 2000[\Omega] = 2[k\Omega]$$

Resistor $R1$ is connected in parallel with resistances $R23$ i $R45$. Relation between resistance R and conductance G will be applied $\rightarrow G = \frac{1}{R}$.

$$G1 = \frac{1}{R1} = \frac{1}{1000}[S]$$

$$G23 = \frac{1}{R23} = \frac{1}{2000}[S]$$

$$G45 = \frac{1}{R45} = \frac{1}{2000}[S]$$

$$G12345 = G1 + G23 + G45$$

$$G12345 = \frac{1}{1000} + \frac{1}{2000} + \frac{1}{2000} = \frac{2}{2000} + \frac{1}{2000} + \frac{1}{2000}$$

$$G12345 = \frac{4}{2000}[S]$$

Resistance which is seen from A and B terminals, is given by equation below.

$$R_{AB} = \frac{1}{G12345}$$

$$R_{AB} = \frac{2000}{4}$$

$$R_{AB} = 250[\Omega]$$