

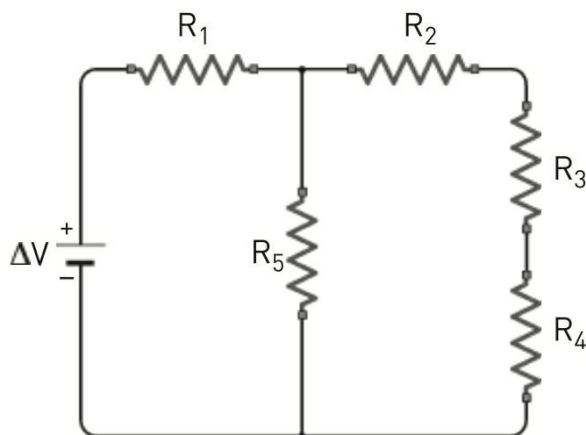
10/5/2018

38

★★★

Il circuito in figura contiene un generatore che mantiene una differenza di potenziale di 80 V e cinque resistenze che valgono $R_1 = 80 \, \Omega$, $R_2 = R_4 = 10 \, \Omega$, $R_3 = 20 \, \Omega$, $R_5 = 40 \, \Omega$.

► Risolvi il circuito.



$$[R_{eq} = 100 \, \Omega, i = i_1 = 0,80 \, \text{A}, \Delta V_1 = 64 \, \text{V}, \Delta V_5 = 16 \, \text{V}, i_5 = i_2 = i_3 = i_4 = 0,40 \, \text{A}; \Delta V_2 = \Delta V_4 = 4,0 \, \text{V}; \Delta V_3 = 8,0 \, \text{V}]$$

SERIE

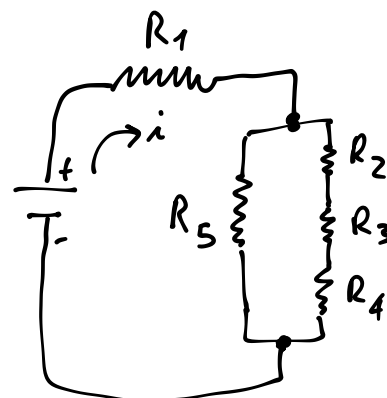
$$R_{234} = R_2 + R_3 + R_4 = 10 \, \Omega + 20 \, \Omega + 10 \, \Omega = 40 \, \Omega$$

PARALLELO

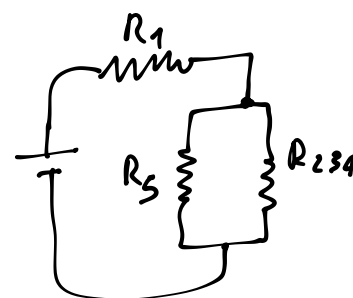
↳ unione le formule $R_{eq} = \frac{R_1 R_2}{R_1 + R_2}$ $\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2}$

$$R_{2345} = \frac{R_5 \cdot R_{234}}{R_5 + R_{234}} = \frac{40 \cdot 40}{40 + 40} = \frac{1600}{80} = 20 \, \Omega$$

$$R_{eq} = R_1 + R_{2345} = 80 \, \Omega + 20 \, \Omega = 100 \, \Omega$$

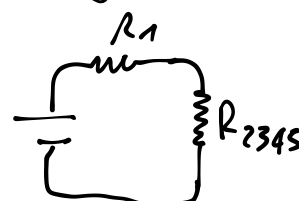


II

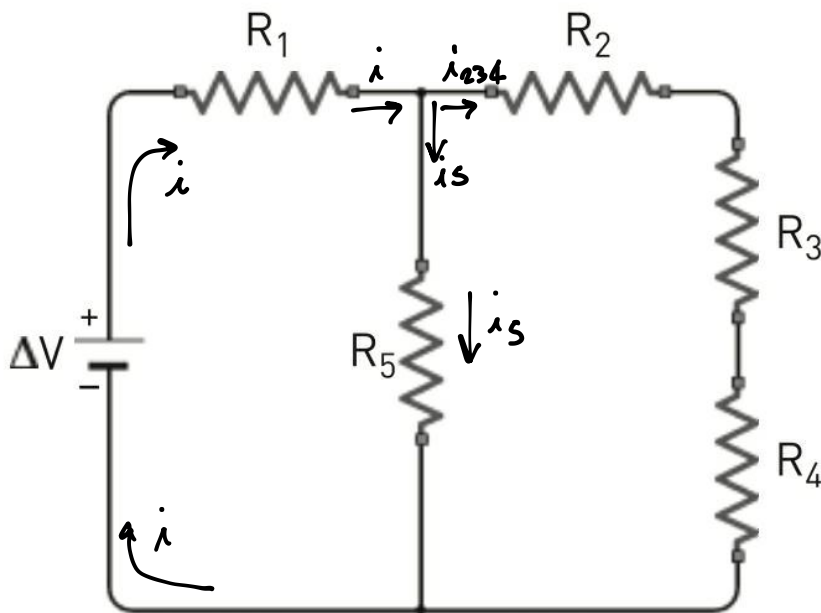


↓ applicazione
di parallelo
di R_5 e R_{234}

III



R_1 e R_{2345}
sono in serie



$$R_{eq} = 100 \Omega$$

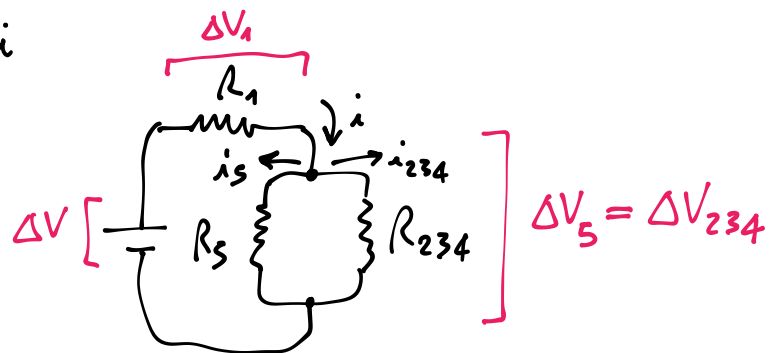
$$\Delta V = 80 V$$

1º LEQUE DI OHM



$$i = \frac{\Delta V}{R_{eq}} = \frac{80V}{100\Omega} = \boxed{0,80 A}$$

$$i_{234} = i_2 = i_3 = i_4 \quad i_1 = i$$



$$i = i_5 + i_{234}$$

$$\Delta V = \Delta V_1 + \Delta V_{234}$$

$$\Delta V_1 = R_1 \cdot i = (80 \Omega)(0,80 A) = 64 V$$

⇓

$$\Delta V_5 = \Delta V_{234} = \Delta V - \Delta V_1 = 80V - 64V = 16V$$

$$i_5 = \frac{\Delta V_5}{R_5} = \frac{16V}{40\Omega} = 0,40 A$$

$$i_{234} = i - i_5 = 0,80 A - 0,40 A = 0,40 A$$

$$\Delta V_2 = R_2 \cdot i_2 = R_2 \cdot i_{234} = (10\Omega)(0,40 A) = \boxed{4,0 V}$$

$$\Delta V_3 = R_3 \cdot i_3 = (20\Omega)(0,40 A) = \boxed{8,0 V}$$

$$\Delta V_4 = R_4 \cdot i_4 = \boxed{4,0 V}$$

$$i_1 = i = \boxed{0,80 A}$$

$$i_5 = \boxed{0,40 A}$$

$$i_2 = i_3 = i_4 = \boxed{0,40 A}$$