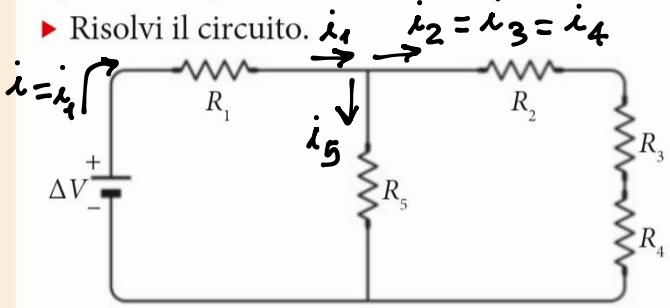
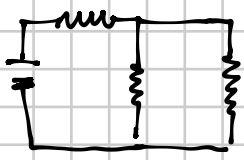
36 **ORA PROVA TU** Il circuito in figura contiene un generatore che mantiene una differenza di potenziale di 80 V e cinque resistenze che valgono $R_1 = 80\ \Omega$, $R_2 = R_4 = 10\ \Omega$, $R_3 = 20\ \Omega$, $R_5 = 40\ \Omega$.

▸ Risolvi il circuito.

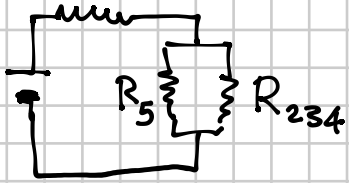


[$R_{eq} = 100\ \Omega$; $i = i_1 = 0{,}80$ A; $\Delta V_1 = 64$ V; $\Delta V_5 = 16$ V; $i_5 = i_2 = i_3 = i_4 = 0{,}40$ A; $\Delta V_2 = \Delta V_4 = 4{,}0$ V; $\Delta V_3 = 8{,}0$ V]



$R_{eq} = R_2 + R_3 + R_4$

$= 40\ \Omega$



$$\frac{1}{R_{eq}} = \frac{1}{R_5} + \frac{1}{R_{234}}$$

$$R_{eq} = \frac{R_5 \cdot R_{234}}{R_5 + R_{234}} = \frac{40 \cdot 40}{80}\ \Omega$$

$= 20\ \Omega$

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

$$i = \frac{\Delta V}{R_{tot}} = \frac{80\,V}{100\,\Omega} = 0{,}80\ A = i_1$$

$$\Delta V_1 = R_1 i_1 = (80\,\Omega)(0{,}80\,A) = 64\,V$$

$$\Delta V_5 = \Delta V - \Delta V_1 = 80\,V - 64\,V = 16\,V$$

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

$$i_1 = i_5 + i_2 \Rightarrow i_2 = i_1 - i_5 = 0{,}80A - 0{,}40A = 0{,}40A$$

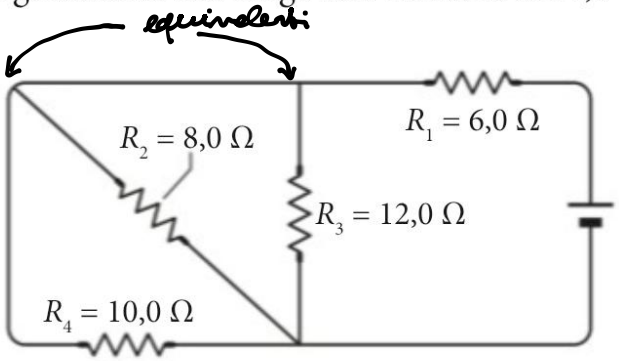
$$\Delta V_2 = R_2 \cdot i_2 = (10\,\Omega) \cdot (0{,}40\,A) = 4{,}0\,V$$

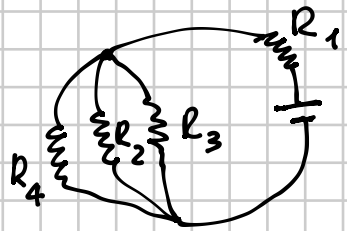
$$\Delta V_3 = R_3 i_3 = (20\,\Omega) \cdot (0{,}40A) = 8{,}0\,V$$

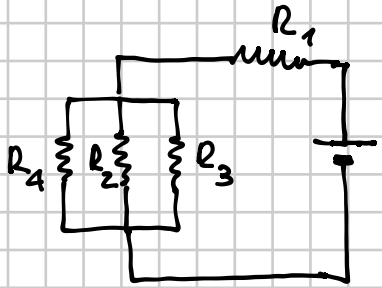
$$\Delta V_4 = R_4 \cdot i_4 = (10\,\Omega) \cdot (0{,}40\,A) = 4{,}0\,V$$

← oppure per differenza perché $\Delta V_2 + \Delta V_3 + \Delta V_4 = 16\,V$ (come ΔV_5)

38 **ORA PROVA TU** Il circuito nella figura è alimentato da un generatore che eroga una tensione di 24,0 V.







▶ Calcola le intensità di corrente che attraversano ogni resistore.

$[i_1 = 2{,}60\ A;\ i_2 = 1{,}05\ A;\ i_3 = 0{,}702\ A;\ i_4 = 0{,}842\ A]$

$$\frac{1}{R_{//}} = \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4} = \frac{1}{8{,}0\,\Omega} + \frac{1}{12{,}0\,\Omega} + \frac{1}{10{,}0\,\Omega} = \frac{15 + 10 + 12}{120}\ \Omega^{-1}$$

$$= \frac{37}{120}\ \Omega^{-1} \qquad R_{//} = \frac{120}{37}\ \Omega$$

$$R_{eq} = R_{//} + R_1 = \frac{120}{37}\,\Omega + 6{,}0\,\Omega = \frac{342}{37}\,\Omega$$

$$i = i_1 = \frac{\Delta V}{R_{eq}} = \frac{24{,}0\ V}{\frac{342}{37}\,\Omega} = 2{,}5964\ldots\ A \simeq \boxed{2{,}60\ A}$$

$$\Delta V_1 = i_1 R_1 \qquad \Delta V_{//} = \Delta V - \Delta V_1 = 24{,}0\,\Omega - (2{,}596\ldots\ A)(6{,}0\,\Omega) =$$

$$= 8{,}42105\ldots\ V$$

$$i_2 = \frac{\Delta V_{//}}{R_2} = \frac{8{,}421\ldots\ V}{8{,}0\,\Omega} = 1{,}0526\ldots\ A \simeq \boxed{1{,}05\ A}$$

$$i_3 = \frac{\Delta V_{//}}{R_3} = \frac{8{,}421\ldots\ V}{12{,}0\,\Omega} = 0{,}7017\ldots\ A \simeq \boxed{0{,}702\ A}$$

$$i_4 = \frac{\Delta V_{//}}{R_4} = \frac{8{,}421\ldots\ V}{10\,\Omega} = 0{,}8421\ldots\ A \simeq \boxed{0{,}842\ A}$$