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$Q(t) = 2C \cdot \sin\left(\frac{3}{2}s^{-1}\, t\right)$ carica che passa in un filo

↝ ometto le udm: $Q(t) = 2\sin\left(\frac{3}{2}t\right)$

▷ $i(t)$ istante per istante

$$i(t) = Q'(t) = 2\left(\cos\left(\frac{3}{2}t\right)\right)\cdot\frac{3}{2} = 3\cos\frac{3}{2}t$$

▷ Valore di $i(t)$ al tempo $t = 0{,}20\,s$

$$i(0{,}2) = 3\cos\left(\frac{3}{2}0{,}2\right) = 3\cos\left(\frac{3}{10}\right) \approx \dots$$

▷ Valore max di $i(t)$ e per quali t lo viene raggiunto

Valore max: $i(t) = 3\cos\frac{3}{2}t \leq 3\cdot 1 \leq 3$ ($\cos\frac{3}{2}t \leq 1$)

Può assumere il valore 3 quando $\cos\frac{3}{2}t = 1$

$\frac{3}{2}t = 2k\pi$ ↝ $t = \frac{4}{3}k\pi$ $\quad (k \in \mathbb{N})$

Consiglio Spassionato: Vedere esercizio 126 con derivate...

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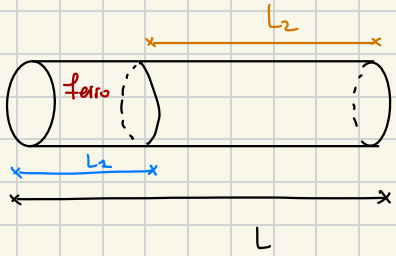


$A = 3{,}0 \cdot 10^{-8}\ m^2$ $\quad R_{TOT} = 8\ \Omega$

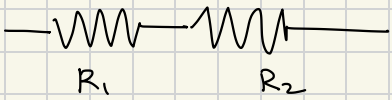
$L = 4{,}5\ m$

$L_1 = 1{,}5\ m$ ferro $\quad \rho_2 = ?$

$L_2 = L - L_1 = 3\ m$

$\rho_1 = 1 \cdot 10^{-7}\ m \cdot \Omega$ (ferro)

$$R_{TOT} = \rho_{TOT} \frac{L}{A} \quad \rightsquigarrow \quad \rho_{TOT} = \frac{A}{L} R_{TOT}$$



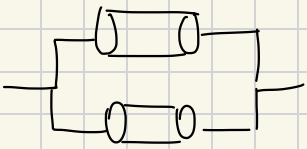
$$R_{TOT} = R_1 + R_2$$

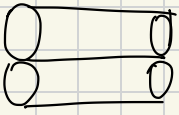
$$R_{TOT} = \rho_1 \frac{L_1}{A} + \rho_2 \frac{L_2}{A}$$

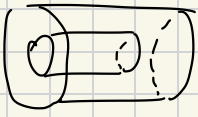
$$\rho_{TOT} \frac{L}{A} = \rho_1 \frac{L_1}{A} + \rho_2 \frac{L_2}{A} \qquad \rho_{TOT} L = \rho_1 L_1 + \rho_2 L_2$$

$$\rho_2 L_2 = \rho_{TOT} L - \rho_1 L_1 \quad \rightsquigarrow \quad \rho_2 = \frac{\rho_{TOT} L - \rho_1 L_1}{L_2}$$

Consiglio spassionato: provare a vedere







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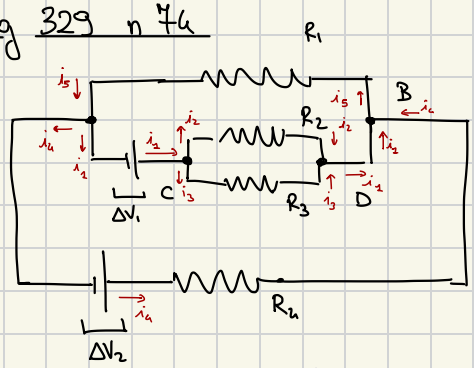


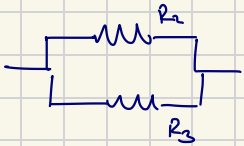
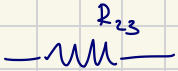
$\Delta V_1 = 47V$ $\quad R_1 = 21\ \Omega$

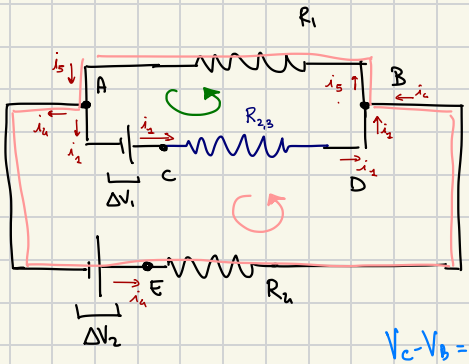
$\Delta V_2 = 40V$ $\quad R_2 = 12\ \Omega$

$R_3 = 35\ \Omega$

$R_4 = 57\ \Omega$

i di ogni corrente del circuito.

Il box  lo sostituisco con 



$$\frac{1}{R_{23}} = \frac{1}{R_2} + \frac{1}{R_3}$$

1 Legge: $\boxed{i_5 = i_1 + i_4}$

$$V_C - V_B = \Delta V = i_1 R_{23}$$

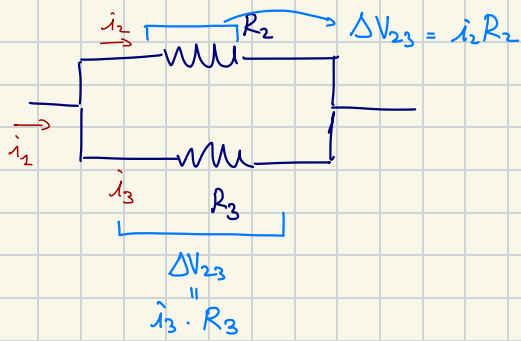
Maglia Verde: $(V_C - V_A) + (V_B - V_C) + (V_A - V_B) = 0$

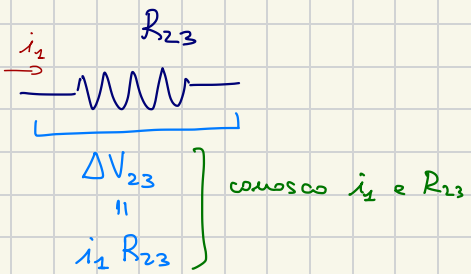
$$\boxed{\Delta V_1 - i_1 R_{23} - i_5 \cdot R_1 = 0}$$

Maglia Rosa: $(V_E - V_A) + (V_B - V_E) + (V_A - V_B) = 0$

$$\boxed{\Delta V_2 - i_4 R_4 - i_5 R_1 = 0}$$

$\Rightarrow$ Faccio il sistema e trovo i_1, i_4, i_5. Le ho trovate.





$\Rightarrow$ e ricavo i_2 e i_3

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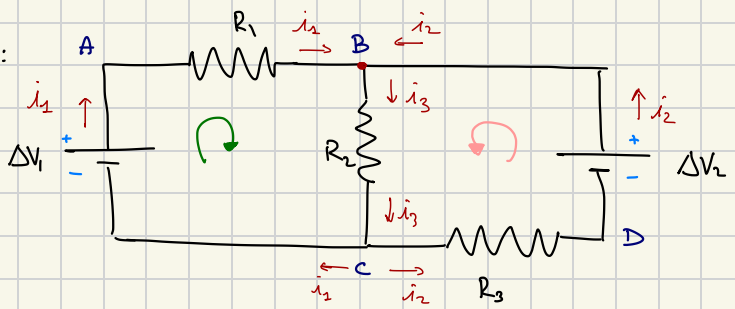

$\Delta V_1 = 12\,V$
$\Delta V_2 = 24\,V$
$R_1 = 10\,\Omega$
$R_2 = 20\,\Omega$
$R_3 = 30\,\Omega$

$$i_1 + i_2 = i_3$$

$$(V_A - V_C) + (V_B - V_A) + (V_C - V_B) = 0$$

$$\Delta V_1 - i_1 R_1 - i_3 R_2 = 0$$

$$(V_B - V_D) + (V_C - V_B) + (V_D - V_C) = 0$$

$$\Delta V_2 - i_3 R_2 - i_2 R_3 = 0$$

$$\begin{cases} i_1 + i_2 = i_3 \\ 12 - 10 i_1 - 20 i_3 = 0 \\ 24 - 20 i_3 - 30 i_2 = 0 \end{cases}$$

$$\begin{cases} i_1 + i_2 = i_3 \\ 6 - 5 i_1 - 10 i_1 - 10 i_2 = 0 \\ 12 - 10 i_1 - 10 i_2 - 15 i_2 = 0 \end{cases}$$

$$\begin{cases} 15 i_1 + 10 i_2 = 6 \\ 10 i_1 + 25 i_2 = 12 \end{cases} \quad \cdot 2 \uparrow - \quad 3$$

$$55\, i_2 = 30$$

$$i_2 = \frac{24}{55}\ A$$