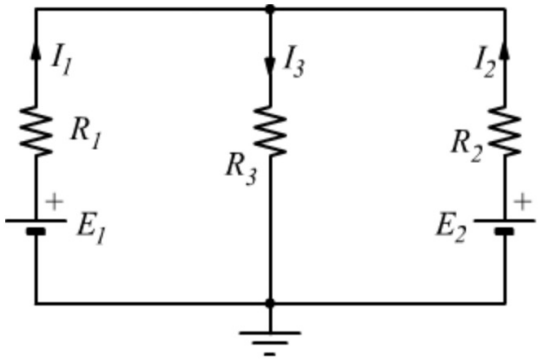
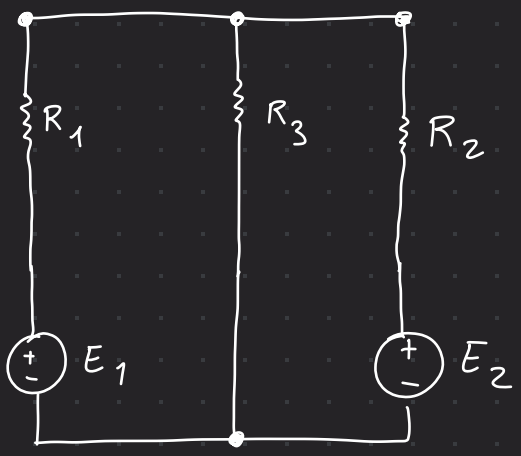
Esercizio 1

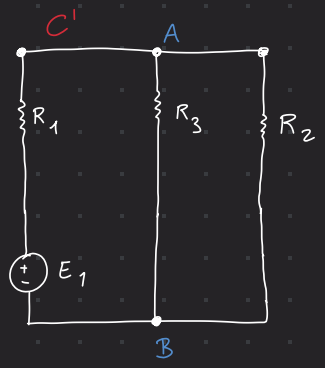
Utilizzando il p.s.e.trovare la corrente I_3

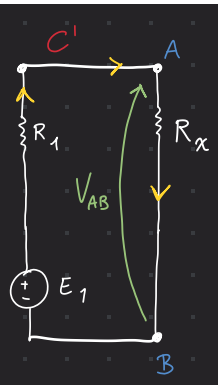


E_1=11V
E_2=7V
R_1=2Ω
R_2=1Ω
R_3=1Ω
I_3=?

[I_3=5A]







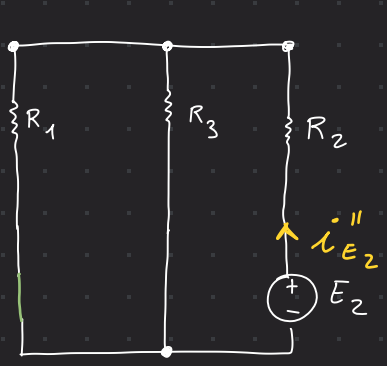
• Trovo i_{E_1}

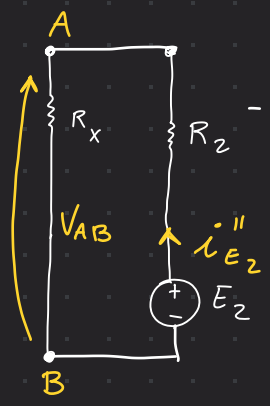
$R_{EQ} = (R_3 \parallel R_2) + R_1 = 2.5\ \Omega$

→ $i_{E_1} = \frac{E_1}{R_{EQ}} = 4.4A$

$i'_3 = i'_{E_1} \cdot \frac{R_2}{R_3+R_2} = \underline{2.2\ A}$

$V_{AB} = i_{E_1} \cdot R_x = 4.4 \cdot \frac{1}{2} = \underline{2.2\ V}$





• Trovo i_{E_2}

→ $R_{EQ} = (R_1 \parallel R_3) + R_2 = \frac{5}{3}\ \Omega$

→ $i_{E_2} = \frac{E_2}{R_{EQ}} = 4.2\ A$

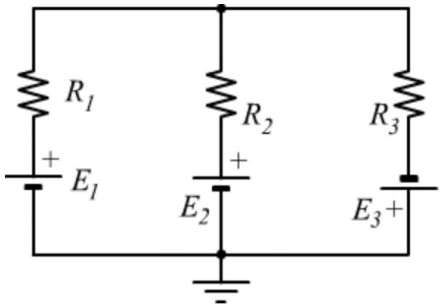
→ $i_3 = i'_{E_2} \cdot \frac{R_1}{R_1+R_3} = \underline{2.8}$

⇒ $I = i'_{E_1} + i''_{E_2} = 2.2 + 2.8 = \boxed{5\ A}$ i_3

$V = V'_{AB} + V''_{AB} = 2.8 + 2.2 = 5\ V$

Esercizio 2

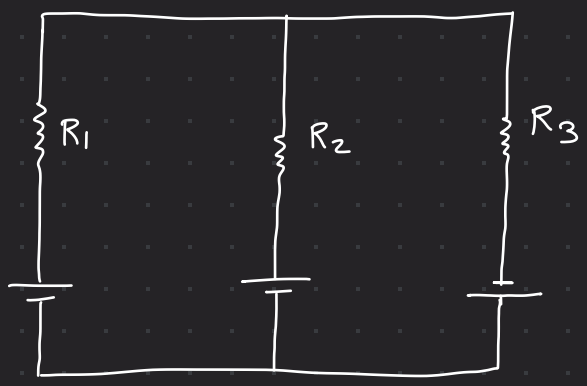
Utilizzando il p.s.e.trovare la corrente I_3



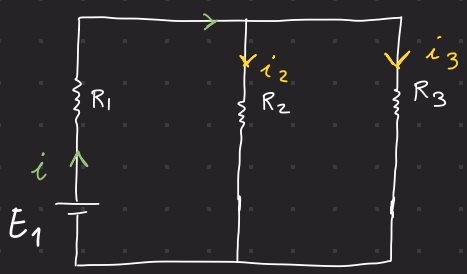
E_1=10V
E_2=7V
E_3=7V
R_1=2Ω
R_2=1Ω
R_3=1Ω

I_3=?

[I_3=9A]



C'

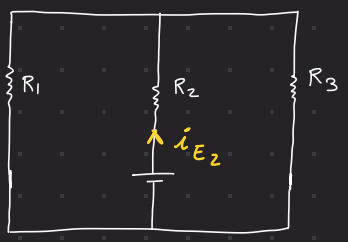


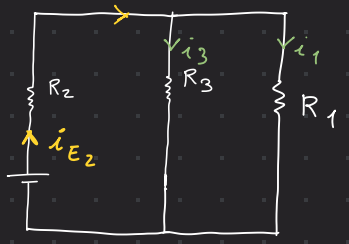
• Trovo i_{E_1} → $R_{eq} = (R_2 \parallel R_3) + R_1 = \frac{5}{2} = 2.5\,\Omega$

→ $i_{E_1} = \frac{E_1}{R_{eq}} = 4\ A$

$i_3' = i \cdot \frac{R_2}{R_2+R_3} = 2\ A$

C''

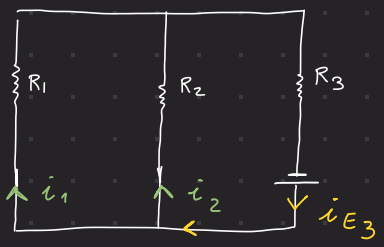




$i_{E_2} = \frac{E_2}{R_{EQ}} = 4.2\ A$

→ $i_3'' = i_{E_2} \cdot \frac{R_1}{R_3+R_1} = 2.8\ A$

C'''



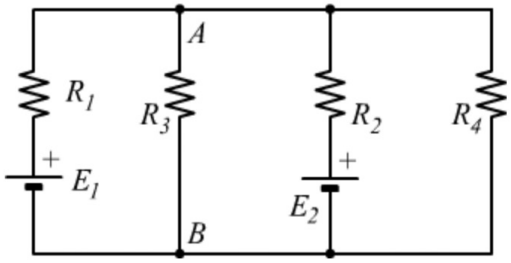
$i_{E_3}''' = \frac{E_3}{R_{EQ}} = 4.2\ A$

Time 13'

$\Rightarrow I_3 = i_3' + i_3'' + i_3''' = 4.2 + 2.8 + 2 = 9A$ Ans

Esercizio 3

Utilizzando il p.s.e.trovare la corrente I_3



$R_1=R_3=1\Omega$

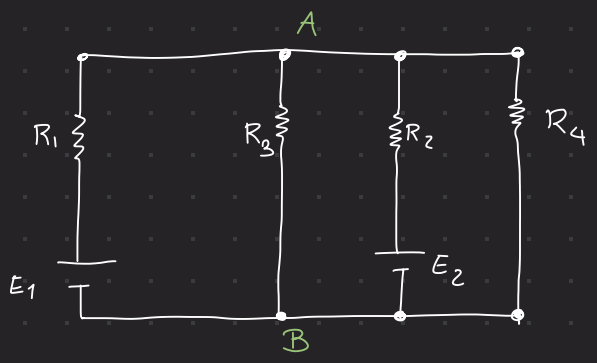
$R_2=R_4=2\Omega$

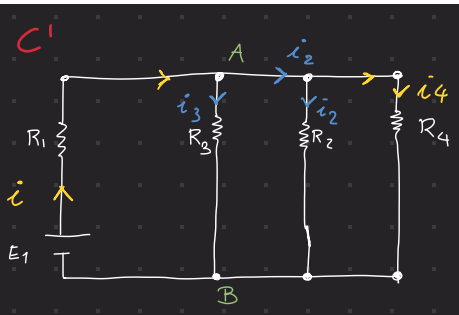
$E_1=6V$

$E_2=3V$

$I_3=?$

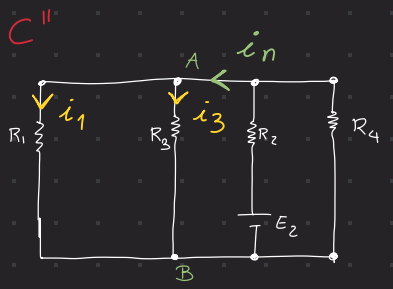
[$I_3=2{,}5A$]





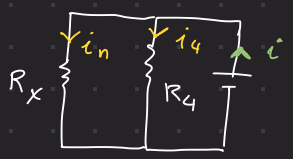
$R_x = R_2 \parallel R_4 = 1\,\Omega \quad \rightarrow \quad i_3 = i_E \cdot \dfrac{R_x}{R_3 + R_x}$

$\rightarrow \quad i'_3 = \dfrac{E_1}{\left[(R_2 \parallel R_4) \parallel R_3\right] + R_1} \cdot \dfrac{1}{2} = \boxed{2\ A}$



$i''_{E_2} = \dfrac{E_2}{R_{eq}} = 1.25\ A \qquad \text{Con} \qquad R_{eq} = \left[(R_1 \parallel R_3) \parallel R_4\right] + R_2 = 2.4\ \Omega$

$\Rightarrow \quad R_x = R_1 \parallel R_3 = \dfrac{1}{2}\,\Omega$



$\rightarrow \quad i_n = i''_E \cdot \dfrac{R_4}{R_x + R_4} = 1\ A$

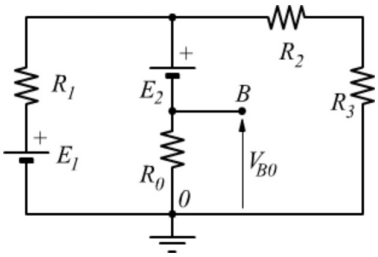
$\Rightarrow \quad i_3 = i_n \cdot \dfrac{R_1}{R_1 + R_3} = \boxed{\frac{1}{2}\ A}$

Time ~25'

$\Rightarrow \quad i_3 = i'_3 + i''_3 = \frac{1}{2} + 2 = \boxed{2.5\ A}$ Ans

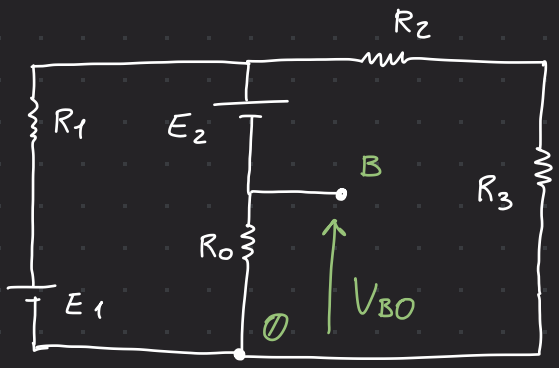
Esercizio 4

Utilizzando il principio di sovrapposizione degli effetti, determinare il valore della caduta di tensione ai capi di R_0

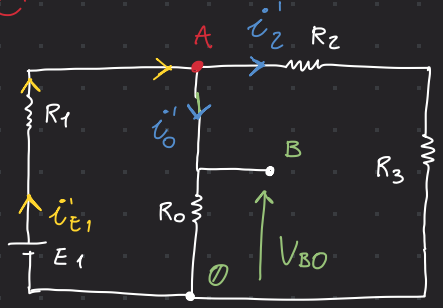


E_1=20V
E_2=3,2V
R_1=12KΩ
R_0=2,88KΩ
R_2=18KΩ
R_3=20KΩ
V_{BO}=?

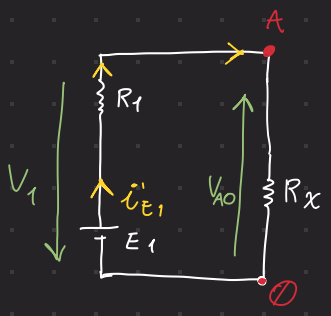
[Risp.:V_{BO}=2,88 V]



C'



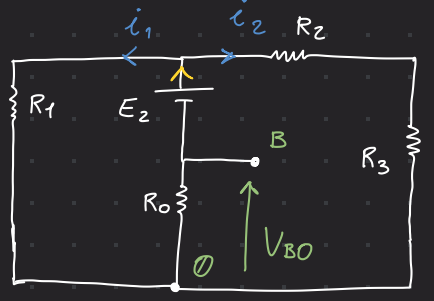
$V_{BO} = V_{AO}$ ⇒ Circuito eq

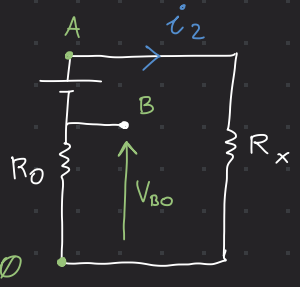


$R_x = (R_2+R_3) \| R_0$
$= 2677.1\ \Omega$
$= 2.67\ K\Omega$

Partitore di Tensione

$$V'_{AO} = V_1 \cdot \frac{R_x}{R_x + R_1} = 20V \cdot \frac{2.67 \cancel{\times 10^3}}{(2.67+12)\cancel{\times 10^3}} = 3.64\ V$$





$R_x = (R_2+R_3) \| R_1$
$= 9.12\ \Omega$

$$i''_{E_2} = \frac{E_2}{R_{eq}} = \frac{E_2}{R_x + R_0} = 0.267A$$

non so che fine abbiamo fatto i Ke...

$$\Rightarrow V_{BO} = R_0 \cdot i_2 = 0.768\ V = -V''_{BO}$$