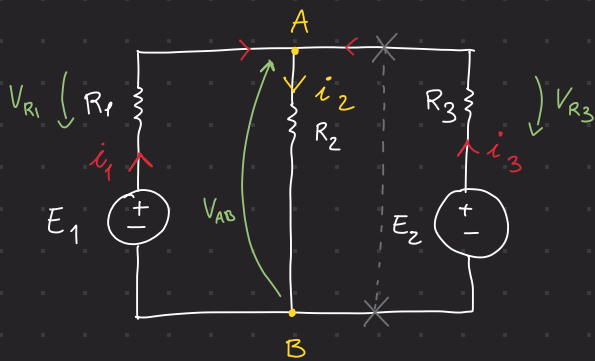
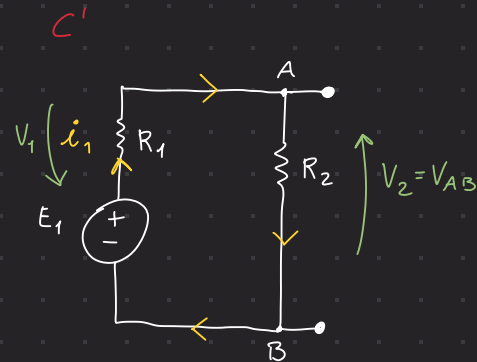


# Demo Thevenin

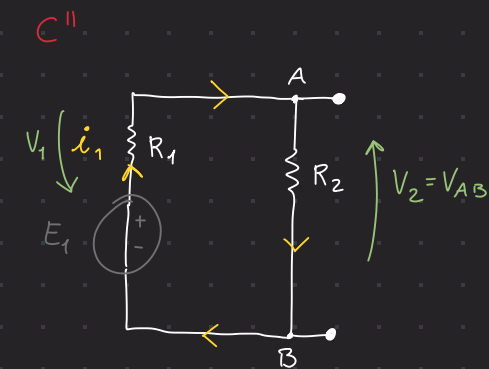


$$\begin{aligned} R_1 &= 1,5 \text{ k}\Omega \\ R_2 &= 3 \text{ k}\Omega \\ R_3 &= 5 \text{ k}\Omega \\ E_1 &= 12 \text{ V} \\ E_2 &= 5 \text{ V} \end{aligned}$$

Q: Ricavare  $I_3$   
e  $V_{R3}$

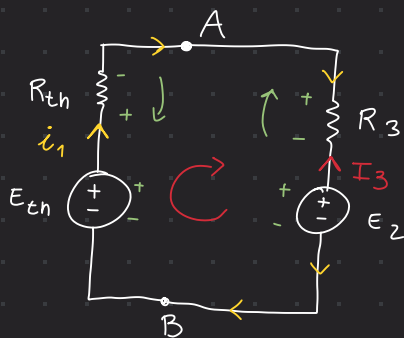
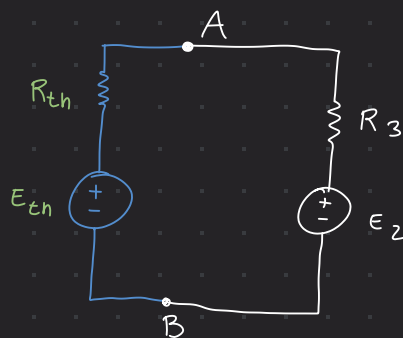


$$(1) \quad E_{Th} = V_{AB}' = V_2 = E_1 \cdot \frac{R_2}{R_2 + R_1} = 8 \text{ V} \quad E_{Th}$$



$$R_{\epsilon a} = R_1 \parallel R_2 = 1 \text{ k}\Omega \quad R_{Th}$$

$\Rightarrow$  Circuito eq di Thevenin



$$-E_{Th} + V_{Th} + V_3 + E_2 = 0$$

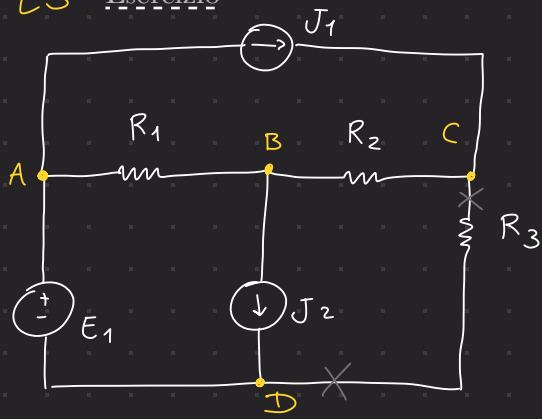
$$\hookrightarrow i_1 (R_{Th} + R_3) = E_{Th} - E_2$$

$$\Rightarrow i_1 = \frac{E_{Th} - E_2}{R_{Th} + R_3} = 0.5 \text{ mA}$$

$$\Rightarrow i_3 = -i_1 = -0.5 \text{ mA} \quad \text{Ans 1}$$

$$V_{R3} = I_3 \cdot R_3 = -2.5 \text{ V} \quad \text{Ans 2}$$

# ES Esercizio



• Troviamo i Valori nel Ramo C-D ovvero su  $R_3$

$$E_0 = 10 \text{ V}$$

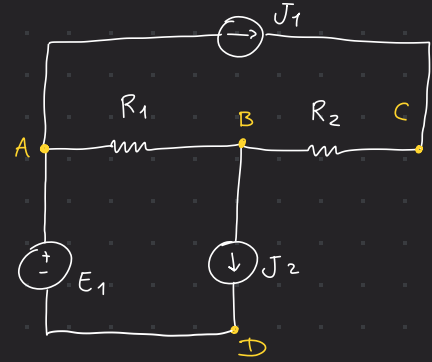
$$I_{01} = 4 \text{ A}$$

$$I_{02} = 5 \text{ A}$$

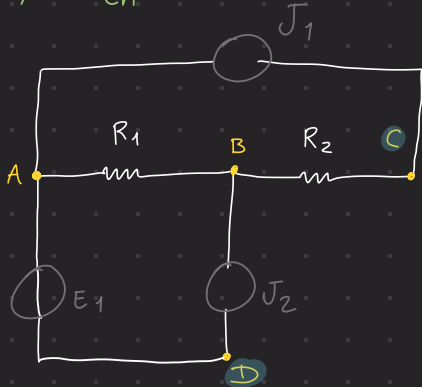
$$R_1 = 1 \Omega$$

$$R_2 = 1 \Omega$$

$$R_3 = 2 \Omega$$

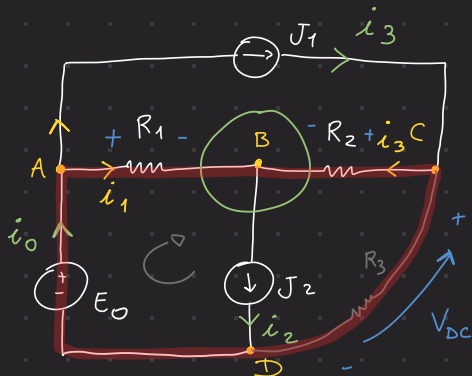


(1)  $R_{th}$



$$R_{thCD} = R_1 + R_2 = 2 \Omega$$

(2)  $V_{th} = V_{DC}$



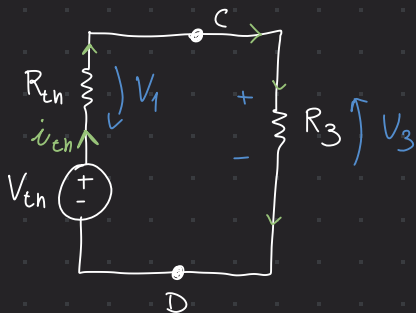
$$LKC_B: -i_1 - i_3 + i_2 = 0 \Rightarrow i_1 = i_2 - i_3$$

$$\Rightarrow i_1 = J_2 - J_1 = 1 \text{ A}$$

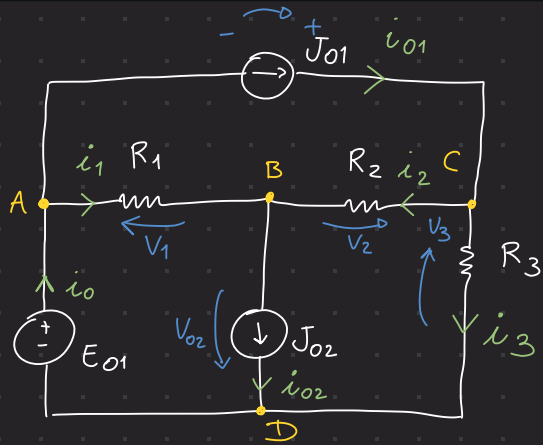
$$LKT_{H1}: -E_0 + i_1 R_1 - i_3 R_2 + V_{DC} = 0$$

$$\Rightarrow V_{DC} = E_0 - i_1 R_1 + i_3 R_2 = 13 \text{ V}$$

$\Rightarrow$  Circuito eq di Th.



$$i_{th} = \frac{V_{th}}{R_{th} + R_3} = 3.25 \text{ A}$$



Ci servono  $i_1, i_2, i_0$

LKC

$$\begin{cases} A: -i_0 + i_1 + i_{01} = 0 \\ B: i_{02} - i_1 - i_2 = 0 \\ C: i_2 + i_3 - i_{01} = 0 \end{cases}$$

$$\Rightarrow i_2 = i_{01} - i_3 = 0.75 \text{ A}$$

$$\Rightarrow i_1 = i_{02} - i_2 = 4.25 \text{ A}$$

$$\Rightarrow i_0 = i_1 + i_{01} = 8.25 \text{ A}$$

$$-V_{01} + V_2 - V_1 = 0 \Rightarrow V_{01} = V_{AC} = V_2 - V_1$$

$$\Rightarrow V_{AC} = i_2 R_2 - i_1 R_1 = -3.5 \text{ V}$$

$$-E_{01} + i_1 R_1 - V_2 = 0 \Rightarrow V_{BD} = i_1 R_1 - E_{01} = -5.75 \text{ V}$$

$\uparrow V_{BD}$

$$P_{E_1}^e = E_1 \cdot i_0 = 82.5 \text{ W} \quad \text{Ans 1}$$

$$P_{J_{01}}^e = V_{AC} \cdot i_{01} = -14 \text{ W}$$

$$P_{J_{02}}^e = V_{BD} \cdot i_{02} = -28.75 \text{ W}$$

$$T_{OT} = 39.75 \text{ W}$$

$$P_{R_1}^a = R_1 \cdot i_1^2 = 18.1 \text{ W}$$

$$P_{R_2}^a = 562 \text{ mW}$$

$$P_{R_3}^a = 21.125 \text{ W}$$

$$\left. \begin{matrix} P_{R_1}^a \\ P_{R_2}^a \\ P_{R_3}^a \end{matrix} \right\} T_{OT} = 39.787 \text{ W}$$