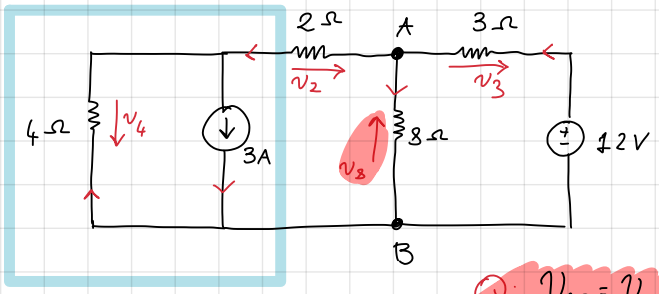
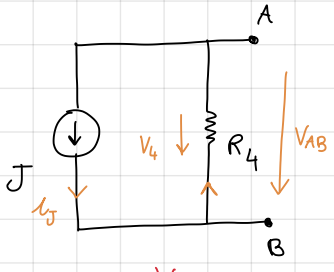
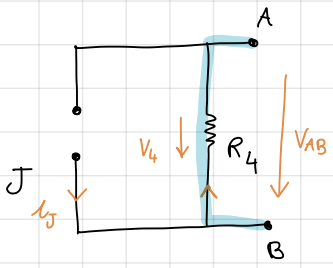


Q: $V_{AB} = v_3 = ?$



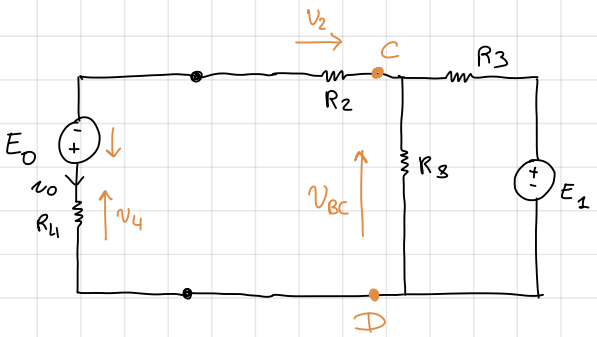
V_{AB}



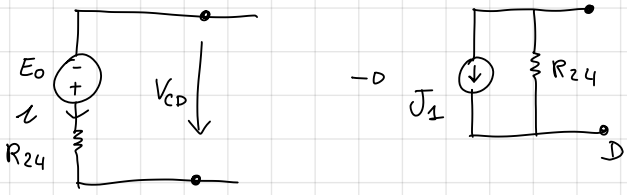
Req

$$\begin{cases} V_{AB} = J \cdot R_4 = 3 \cdot 4 = 12\ V \\ Req = R_4 = 4\ \Omega \end{cases}$$

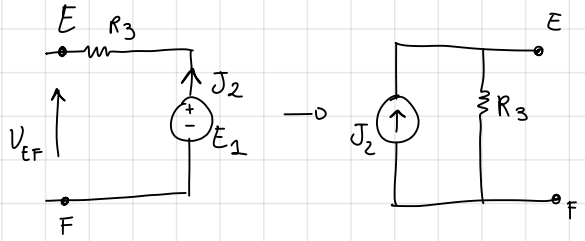
$= 0$



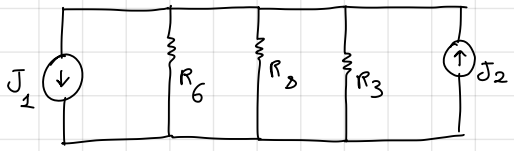
R_4 ed R_2 in Serie

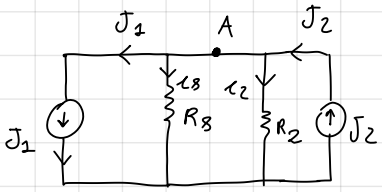


$$J_1 = i = \frac{E_0}{R_{24}} = 2A \quad J_1$$

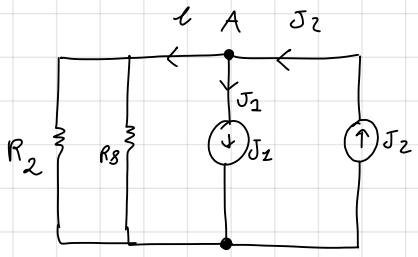


$$J_2 = \frac{E_1}{R_3} = 4A \quad J_2$$



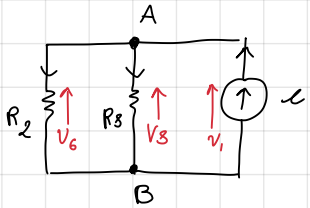


$R_2 = R_6 // R_3$



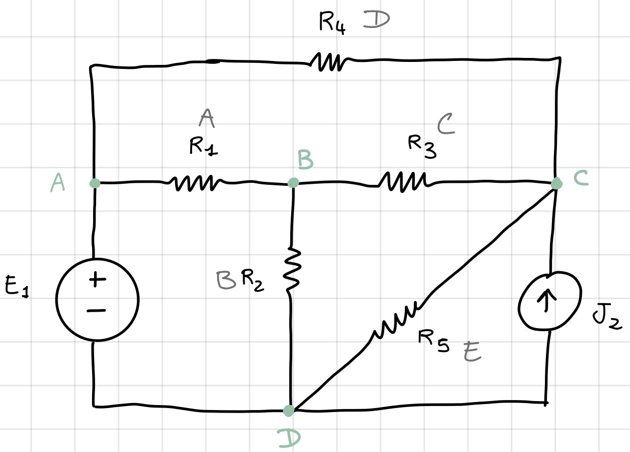
LKC$_A$: $-J_2 + J_1 + i = 0$ → $i = J_2 - J_1 = 2A$

↑ gen eq



LKT$_{M_1}$: $V_8 = v_1 = (R6 // R8) \cdot i = 3.2V$

Ans



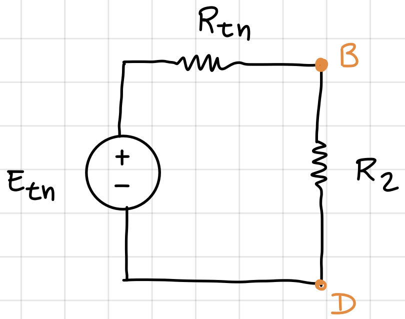
DATI

$E_1 = 20\,V$ $\qquad$ $J_2 = 0.8\,A$

$R_1 = 100\,\Omega$ A
$R_2 = 80\,\Omega$ B
$R_3 = 60\,\Omega$ C
$R_4 = 120\,\Omega$ D
$R_5 = 200\,\Omega$ E

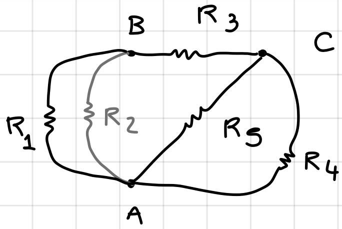
Q_1: $P^a_{R_1, R_2, R_3} = ?$

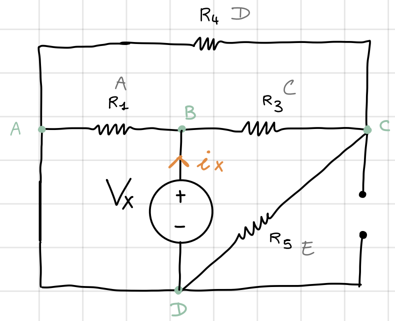
(1) CALCOLARE $P^a_{R_2}$



Per trovare il circuito equivalente di Thevenin ci basta trovare tensione e resistenza equivalenti ai capi dei nodi B e D (I nodi che vogliamo "staccare")

Spegniamo i generatori e rimuoviamo la resistenza ai capi cui vogliamo calcolare la resistenza equivalente



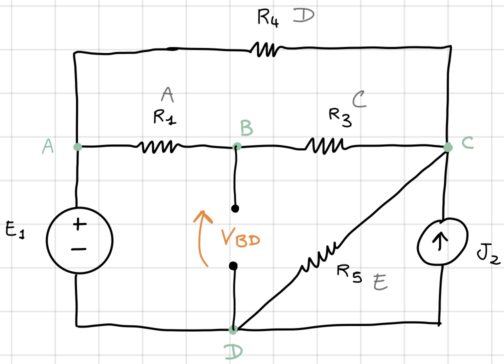


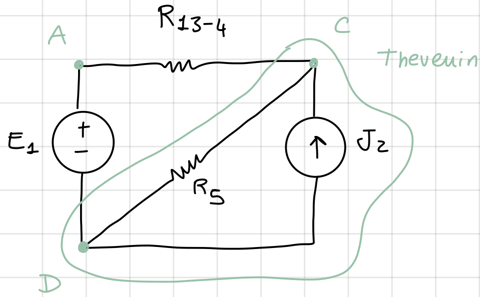
* Possiamo calcolare Req come $R_{eq} = \frac{V_x}{i_x}$

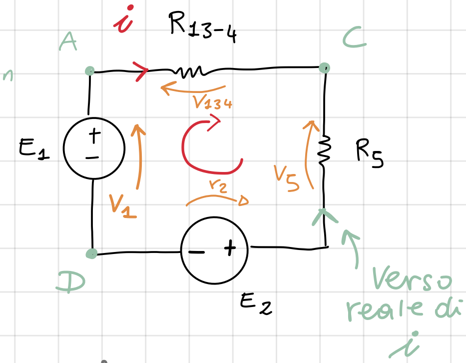
(a)

$$R_{BD} = \underset{A}{R_1} \,//\, \left[(\underset{D}{R_4} // \underset{E}{R_5}) + \underset{C}{R_3} \right] = 57.45\,\Omega \quad R_{tn}$$

(b) $V_{tn} = V_{BD}$ → Rimuoviamo la resistenza e lasciamo i generatori accesi







$E_2 = R_5 \cdot J_2 = 160\,V$

$i\,(R_x + R_5)$ ↗ $68.57\,\Omega$

$$LKT_M = -E_1 + V_{13\text{-}4} + V_5 + V_2 = 0 \rightarrow -E_1 + i \cdot R_{13\text{-}4} + R_5\, i + E_2 = 0$$

$$\Rightarrow i = \frac{E_1 - E_2}{R_x + R_5} = -0.52\,A \rightarrow \text{la corrente va da } E_2 \text{ a } E_1$$

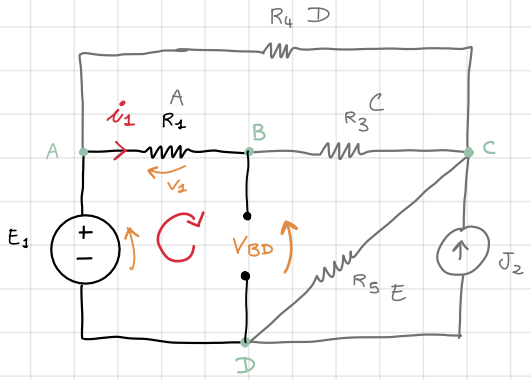
V_{AC}

$$\Rightarrow V_{AC} = R_x \cdot i = -35.66\,V$$

→ TROVO V_1 con il Partitore di Tensione

$$V_1 = V_{AC} \cdot \frac{R_1}{R_1 + R_3} = -22.29\ V \quad \Rightarrow \quad V_2 = V_{AC} - V_1 = -13.37\ V$$

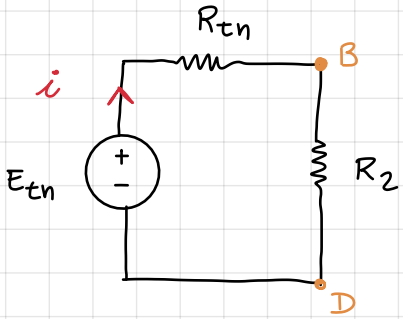
$V_1 = V_{AB}$ $\qquad$ $V_3 = V_{BC}$



$$LKT_M: \quad -E_1 + V_1 + V_{BD} = 0$$

$$\Rightarrow V_{BD} = E_1 - V_1 = 42.29\ V \quad V_{Th}$$

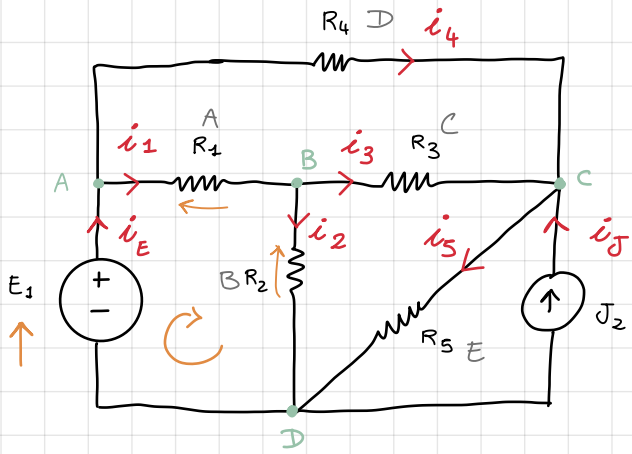
Ritornando al circuito...



$57.45\ \Omega$ R_{th} $\qquad$ $42.29\ V$ V_{Th}

$$\Rightarrow i_{th} = \frac{E_{th}}{R_{th} + R_2} = 0.31\ A \qquad i_{th} = i_2$$

$$\Rightarrow P^a_{R_2} = i_{th}^2 \cdot R_2 = 7.57\ W \quad \text{Ans}_2$$



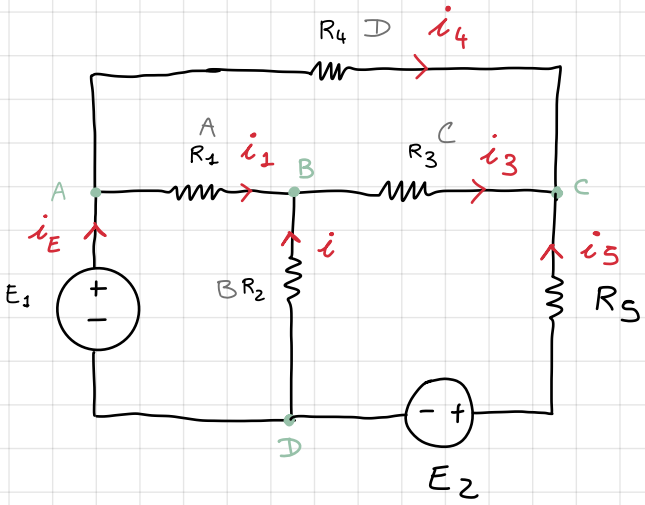
$$LKT\ \{ABD\} = -E_1 + R_1 i_1 + R_2 i_2 = 0$$

$$\rightarrow i_1 = \frac{E_1 - R_2 i_2}{R_1} = -0.048\ A \qquad i_1$$

$$\Rightarrow P^a_{R_1} = 0.23\ W \quad \text{Ans 1}$$

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

$$\rightarrow i_3 = i_1 - i_2 = -0.358 \quad \rightarrow P^a_{R_3} = 7.69\ W \quad \text{Ans 3}$$


R4
D
i4
A
R1
i1
B
R3
C
i3
A
C
iE
i
i5
E1
BR2
R5
D
E2