

DATI

$$E_1 = 20V$$

$$J_2 = 0.8A$$

$$R_1 = 100\Omega$$

$$R_2 = 80\Omega$$

$$R_3 = 60\Omega$$

$$R_4 = 120\Omega$$

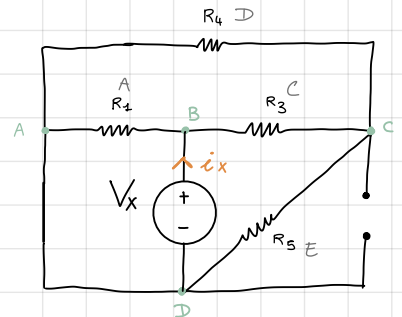
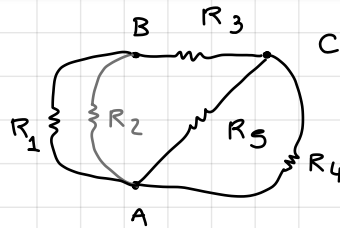
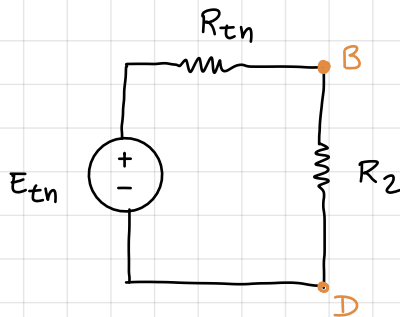
$$R_5 = 200\Omega$$

$$Q_1: P_{R_1, R_2, R_3} = ?$$

(1) CALCOLARE P_{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



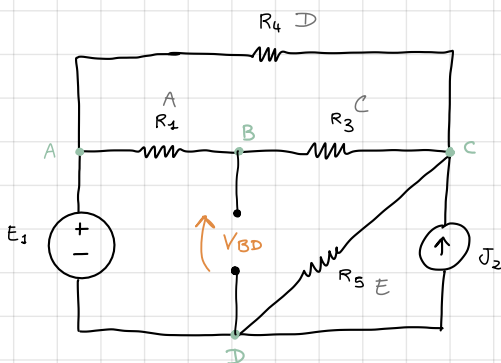
* Possiamo calcolare R_{eq} come

$$R_{eq} = \frac{V_x}{i_x}$$

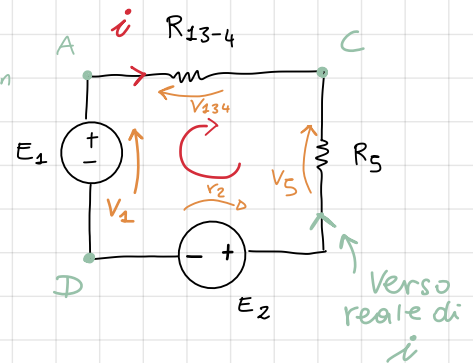
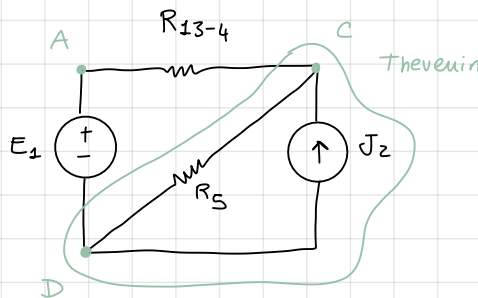
(a)

$$R_{BD} = R_1 \parallel [(R_4 \parallel R_5) + R_3] = 57.45\Omega \quad R_{th}$$

(b) $V_{th} = V_{BD} \rightarrow$ Rimuoviamo la resistenza e lasciamo i generatori accesi



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



$$68.57\Omega$$

$$i(R_x + R_5)$$

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

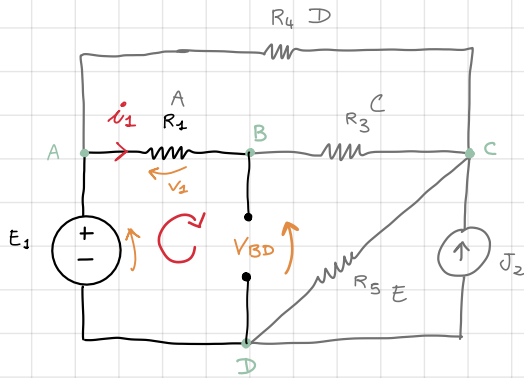
$$\Rightarrow i = \frac{E_1 - E_2}{R_x + R_5} = -0.52A \rightarrow \text{la corrente va da } E_2 \text{ a } E_1$$

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

-> TROVO V_1 Con il Partitore di Tensione

$$V_1 = V_{AC} \cdot \frac{R_2}{R_1 + R_3} = -22.29 \text{ V} \quad \Rightarrow \quad V_2 = V_{AC} - V_1 = -13.37 \text{ V}$$

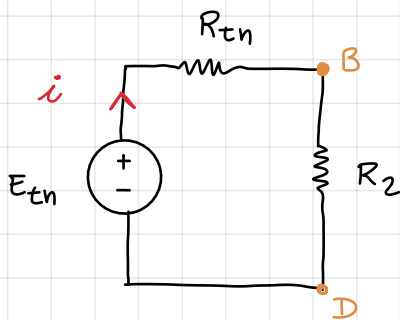
$V_1 = V_{AB}$ $V_3 = V_{BC}$



$$\text{LKT}_M: -E_1 + V_1 + V_{BD} = 0$$

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

Ritornando al circuito...

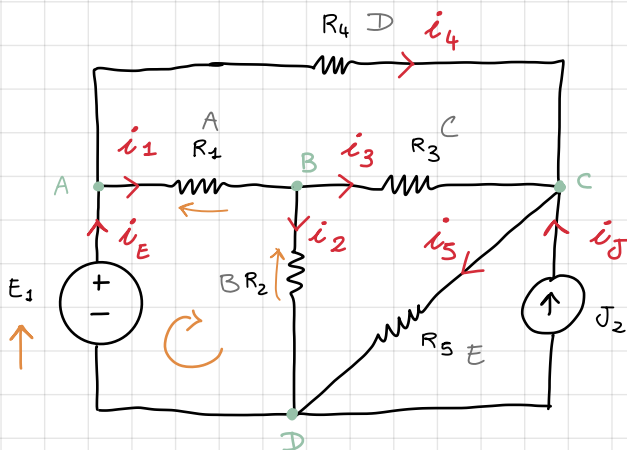


57.45Ω R_{Th} 42.29 V V_{Th}

$$\Rightarrow i_{Th} = \frac{E_{Th}}{R_{Th} + R_2} = 0.31 \text{ A}$$

$i_{Th} = i_2$

$$\Rightarrow P_{R_2}^a = i_{Th}^2 \cdot R_2 = 7.57 \text{ W} \quad \text{Ans}_2$$



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

$$\Rightarrow i_1 = \frac{E_1 - R_2 i_2}{R_1} = -0.048 \text{ A} \quad i_1$$

$$\Rightarrow P_{R_1}^a = 0.23 \text{ W} \quad \text{Ans}_1$$

$$\text{LKC}_B: -i_1 + i_3 + i_2 = 0$$

$$\Rightarrow i_3 = i_4 - i_2 = -0.358 \quad \Rightarrow P_{R_3}^a = 7.69 \text{ W} \quad \text{Ans}_3$$

