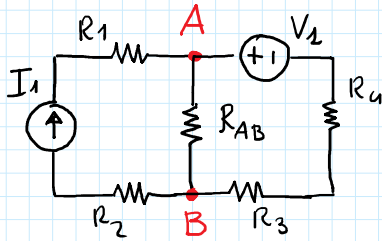


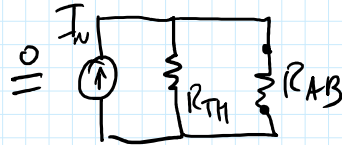
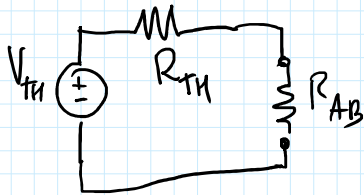
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04 Aprile 2017 12:02



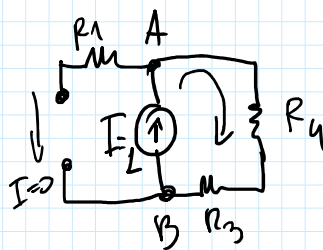
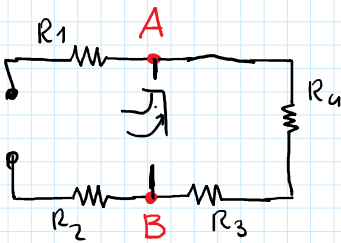
CALCOLARE I CIRCUITI
EQUIVALENTI DI THEVENIN
E NORTON VISTI DA R_{AB}
E CALCOLARE LA POTENZA
ASSORBITA.

VERIFICARE I RISULTATI APPLICANDO I METODI DI
ANALISI.



$$I_N = \frac{V_{TH}}{R_{TH}}$$

CALCOLARE LA RESISTENZA DI THEVENIN/NORTON



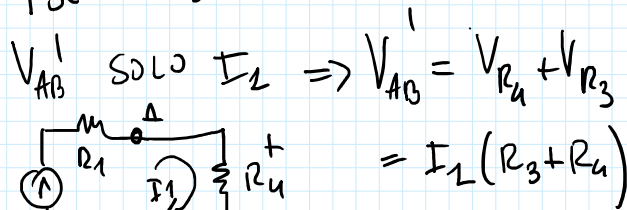
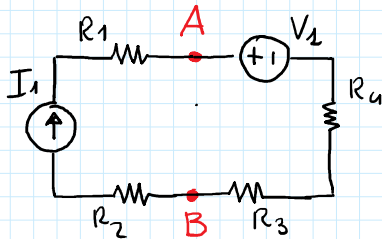
$$R_{TH} = \frac{V_{AB}}{I_P} = V_{AB}$$

$$R_{TH} = R_3 + R_4$$

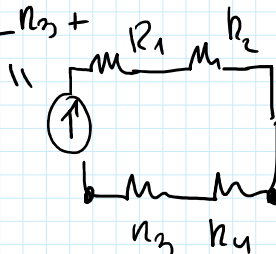
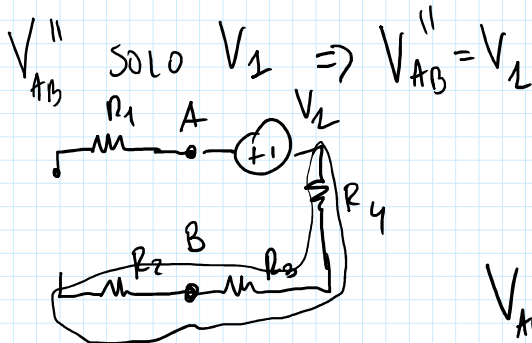
CALCOLO

$$V_{TH} = V_{AB}$$

$$PSE \quad V_{AB} = V_{AB}^I + V_{AB}^{II}$$

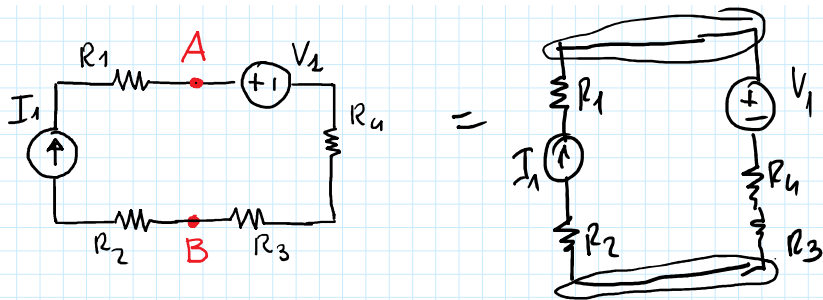


$$V_{AB}^I \text{ SOLO } I_2 \Rightarrow V_{AB}^I = V_{R_4} + V_{R_3} = I_2(R_3 + R_4)$$

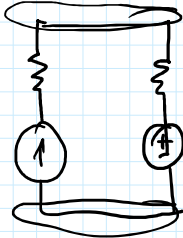


$$V_{AB} = V_{AB}^I + V_{AB}^{II} = I_1(R_3 + R_4) + V_2$$

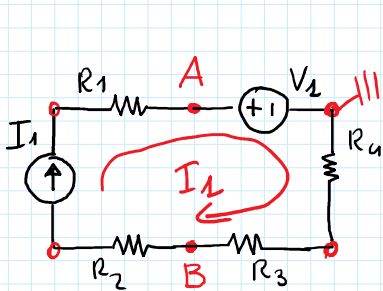
$$V_{TH} = V_1 + I_1(R_3 + R_4)$$



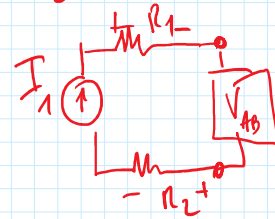
$$V_{AB} = \frac{\sum \frac{V_{A_i}}{R_{A_i}} + \sum I_{B_j}}{\sum \frac{1}{R_{A_i}} + \sum \frac{1}{R_{B_j}}}$$



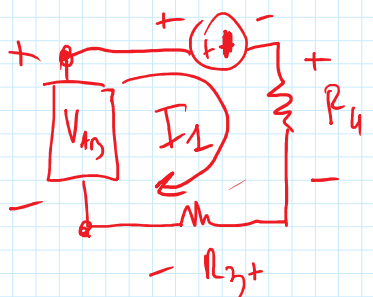
$$V_{AB} = \frac{\frac{V_1}{R_3 + R_4} + I_1}{\frac{1}{R_3 + R_4}} = V_1 + I_1(R_3 + R_4)$$



$$V_{AB} = e_A - e_B$$

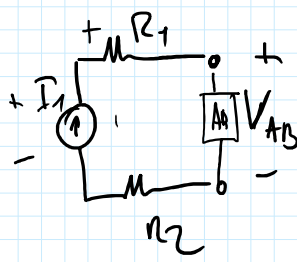
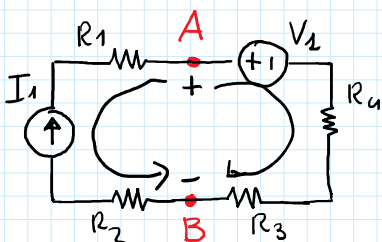


$$V_{I_1} + V_{R_1} + V_{AB} + V_{R_2} = 0$$



$$V_{AB} = V_1 + V_{R_4} + V_{R_3} = V_1 + I_1(R_3 + R_4)$$

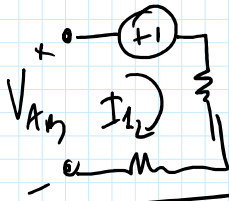
$$V_{TH} = V_1 + I_1(R_3 + R_4)$$



KVL

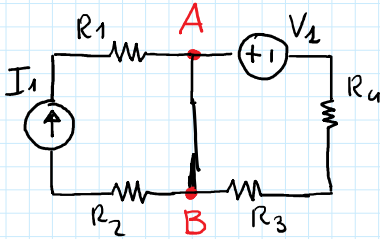
KVL

$$V_{AB} = \downarrow V_{I_1} - I_1(R_1 + R_2) = \boxed{V_{I_1} - I_1 R_1 + V_{AB} + I_1 R_2 = 0}$$



$$V_{AB} = V_1 + I_1 R_1 + I_1 R_2$$

CALCOLO I_N



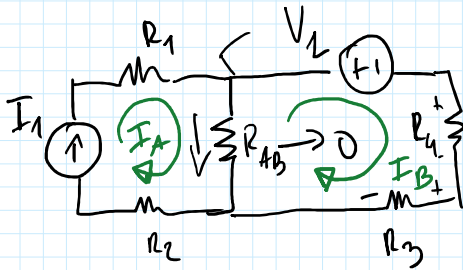
$$\boxed{I_N = I_1 + \frac{V_1}{R_3 + R_4}}$$

$$R_{TH} = R_3 + R_4$$

$$V_{TH} = V_1 + I_1(R_3 + R_4)$$

$$I_N = \frac{V_{TH}}{R_{TH}}$$

$$= \frac{V_1}{R_3 + R_4} + I_1$$



$$\lim_{R_{AB} \rightarrow 0} I_N = I_{R_{AB}}$$

$$I_A = I_1 \quad I_B = \text{incognita}$$

$$I_{R_{AB}} = I_A - I_B$$

$$\textcircled{B} \quad V_1 + I_B R_4 + I_B R_3 + (I_B - I_A) R_{AB} = 0$$

$$I_B (R_3 + R_4 + R_{AB}) = I_A R_{AB} - V_1$$

$$I_B = \frac{I_A R_{AB} - V_1}{R_3 + R_4 + R_{AB}}$$

$$I_{R_{AB}} = I_A - I_B = \frac{I_A (R_3 + R_4 + R_{AB}) - I_A R_{AB} + V_1}{R_3 + R_4 + R_{AB}}$$

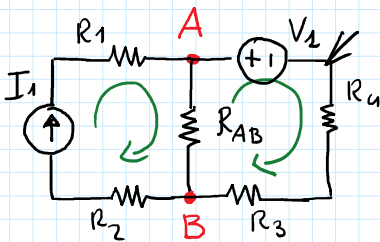
$$= \frac{I_A (R_3 + R_4) + V_1}{R_3 + R_4 + R_{AB}} \xrightarrow{R_{AB} = 0}$$

$$R_3 + R_4 + R_{AB} \rightarrow$$

$$I_1 + \frac{V_1}{R_3 + R_4}$$

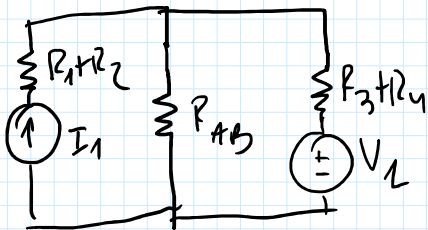
$$V_{TH} = V_1 + I_1(R_3 + R_4) \quad R_{TH} = R_3 + R_4$$

$$P_{R_{AB}} = ? \quad \frac{V_{TH}^2}{(R_{TH} + R_{AB})^2} \quad R_{AB} = \frac{[V_1 + I_1(R_3 + R_4)]^2}{(R_3 + R_4 + R_{AB})^2} R_{AB}$$



$$P_{R_{AB}} = \left[\frac{I_1(R_3 + R_4) + V_1}{R_3 + R_4 + R_{AB}} \right]^2 \cdot R_{AB}$$

$$P_{R_{AB}} = \frac{V_{R_{AB}}^2}{R_{AB}} = \frac{(e_A - e_B)^2}{R_{AB}}$$



$$\frac{\frac{V_1}{R_3 + R_4} + I_1}{\frac{1}{R_3 + R_4} + \frac{1}{R_{AB}}}$$

$$\frac{V_1 + I_1(R_3 + R_4)}{\cancel{R_3 + R_4}} \cdot \frac{1}{\frac{R_3 + R_4 + R_{AB}}{\cancel{(R_3 + R_4)} \cdot R_{AB}}}$$

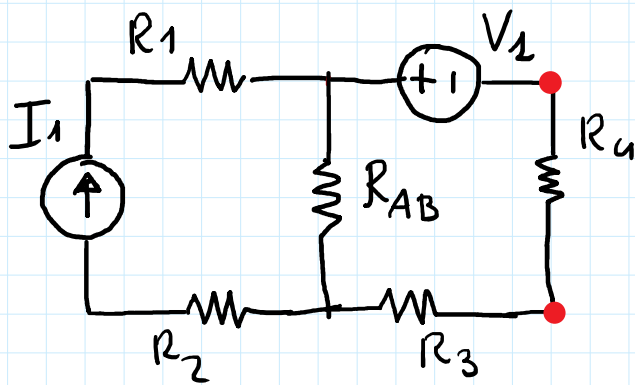
$$V_{R_{AB}} = \left(\frac{[V_1 + I_1(R_3 + R_4)] R_{AB}}{(R_3 + R_4 + R_{AB})} \right)^2 \frac{1}{R_{AB}}$$

$$V_{R_{AB}} = \left(\frac{[V_1 + I_1(R_3 + R_u)] R_{AB}}{(R_3 + R_u + R_{AB})} \right) \frac{1}{R_{AB}}$$

$$\frac{[V_1 + I_1(R_3 + R_u)]^2}{(R_3 + R_u + R_{AB})^2} \cdot R_{AB}$$

ESERCIZI RIASSUNTIVI

04 April 2017 12:02

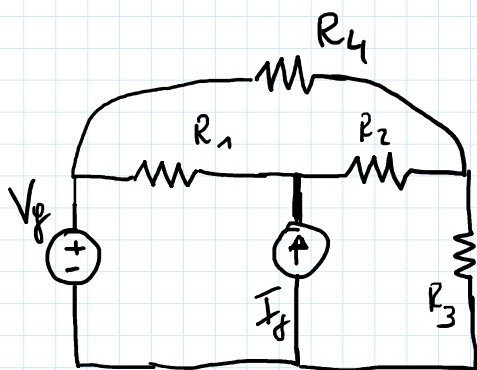


CALCOLARE IL CIRCUITO
EQUIVALENTE DI THEVENIN
E NORTON VISTI DA R_L
E CALCOLARNE LA POTENZA
ASSORBITA.

VERIFICARE I RISULTATI APPLICANDO IL METODO DI
ANALISI!

ESERCIZI RIASSUNTIVI

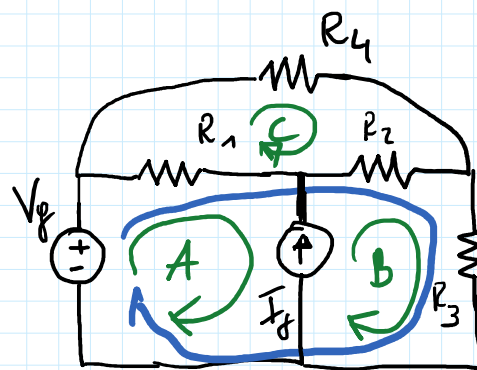
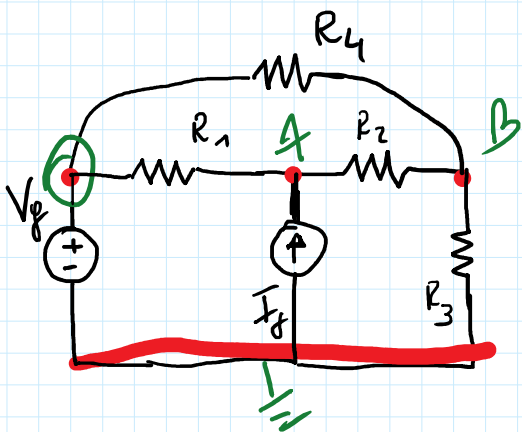
04 Aprile 2017 12:36



1) DETERMINARE
LA POTENZA ASSORBITA
DALLE RESISTENZE
E QUELLA GENERATA DAI
GENERATORI E VERIFICARE CHE

$$\sum_k P_{R_k} = P_{V_g} + P_{I_g}$$

2) Per la resistenza R_3 calcolare i circuiti
equivalenti di Thevenin e Norton e verificare
il valore di P_{R_3} trovato in precedenza.



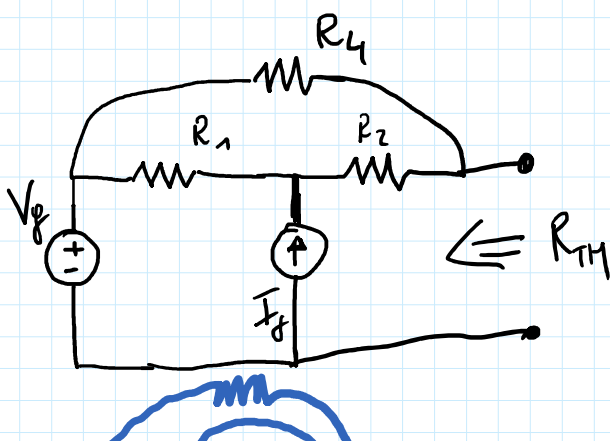
$$I_B - I_A = I_g$$

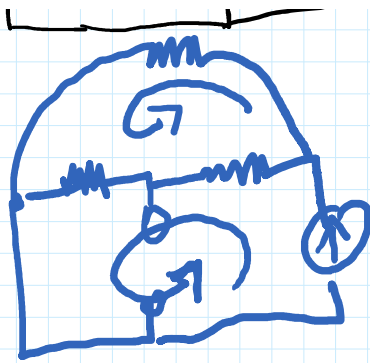
$$I_C \left\{ \begin{array}{l} \text{KVL } \textcircled{C} \end{array} \right.$$

$$I_A \left\{ \begin{array}{l} \text{KVL } \textcircled{A+B} \end{array} \right. \quad I_B = I_A + I_g$$

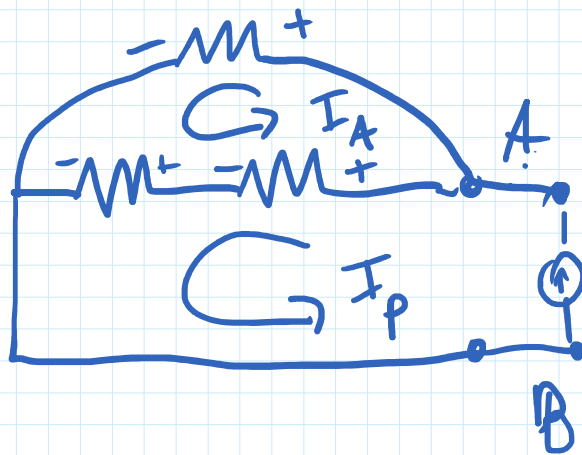
$$I_C \left\{ \begin{array}{l} \text{KVL } \textcircled{C} \end{array} \right.$$

$$I_B \left\{ \begin{array}{l} \text{KVL } \textcircled{A+B} \end{array} \right. \quad I_A = I_B - I_g$$

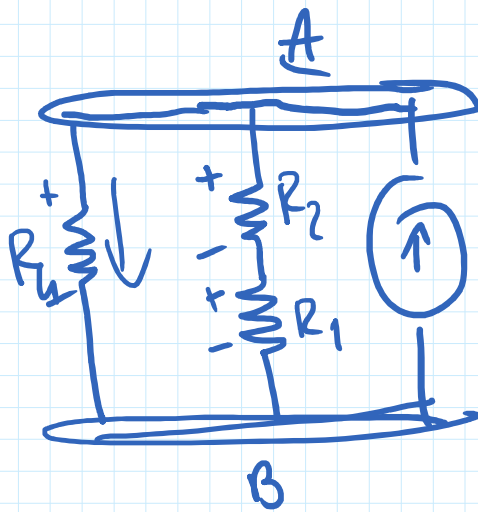




$$R_{TH} = R_2 + R_1 + R_4 + R_1 + R_2$$



$$I_p = 1 \quad V_{AB} = R_{TH}$$



$$V_{AB} = V_{R_4} = V_{R_2} + V_{R_1}$$

$$I_p \cdot \frac{(R_2 + R_1)}{R_1 + R_2 + R_4} \cdot R_4$$

I_{R_4}

$$R_{TH} = \frac{(R_1 + R_2) R_4}{R_1 + R_2 + R_4}$$