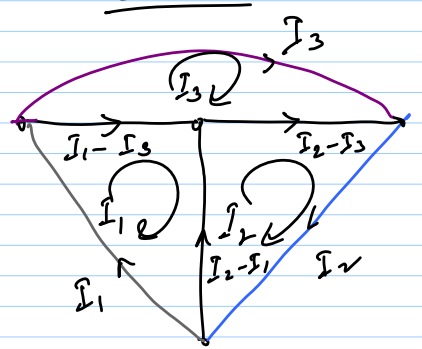
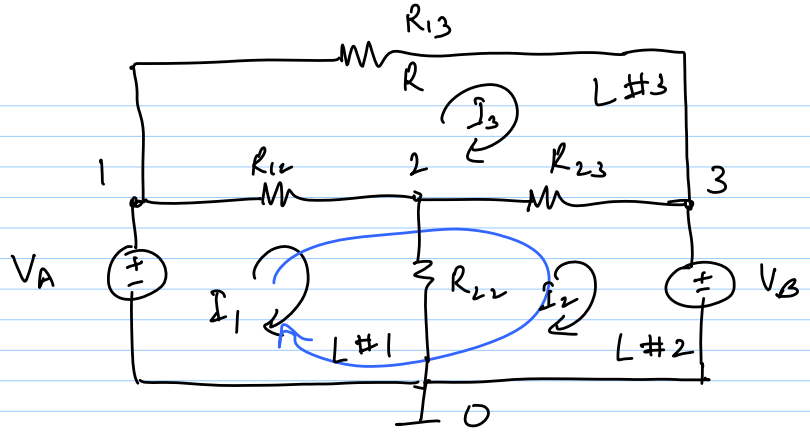
2-2-15

Lec 10





L#1 : $R_{12}(I_1 - I_3) + R_{22}(I_1 - I_2) - V_A = 0$

$(R_{12} + R_{22})I_1 - R_{22}I_2 - R_{12}I_3 = V_A$

L#2

$R_{23}(I_2 - I_3) + V_B + R_{22}(I_2 - I_1) = 0$

$-R_{22}I_1 + (R_{22} + R_{23})I_2 - R_{23}I_3 = -V_B$

L#3

$R_{13}I_3 + R_{23}(I_3 - I_2) + R_{12}(I_3 - I_1) = 0$

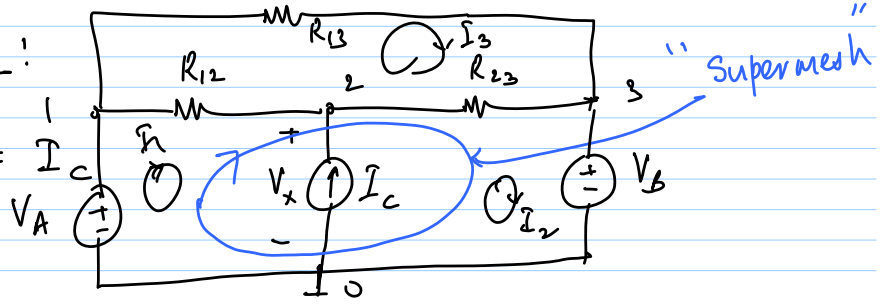
$-R_{12}I_1 - R_{23}I_2 + (R_{13} + R_{23} + R_{12})I_3 = 0$

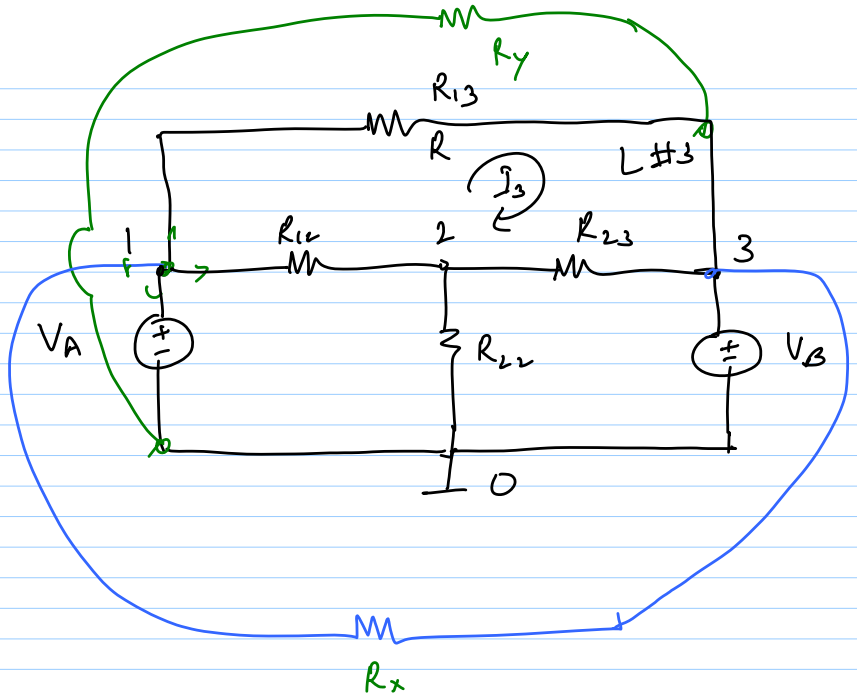
$[R] \cdot \bar{I} = \bar{V}$

$$\begin{matrix} L\#1 \rightarrow \\ L\#2 \rightarrow \\ L\#3 \rightarrow \end{matrix} \begin{bmatrix} R_{12}+R_{22} & -R_{22} & -R_{12} \\ -R_{22} & R_{22}+R_{23} & -R_{23} \\ -R_{12} & -R_{23} & R_{13}+R_{23}+R_{12} \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \\ I_3 \end{bmatrix} = \begin{bmatrix} V_A \\ -V_B \\ 0 \end{bmatrix}$$

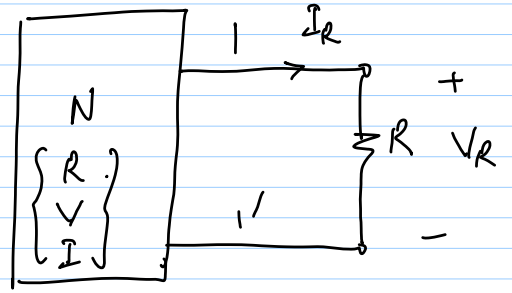
addl. eq'n:

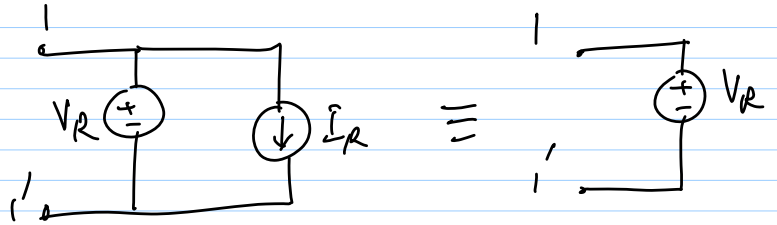
$I_2 - I_1 = I_c$

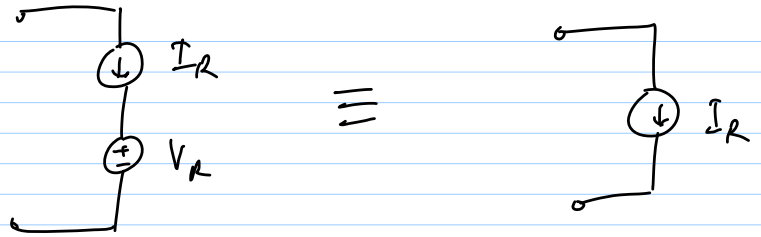


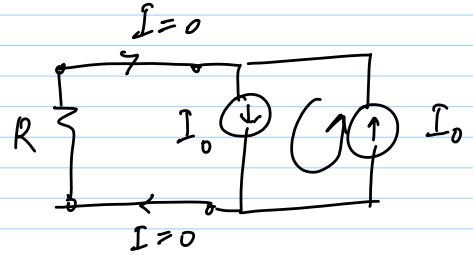


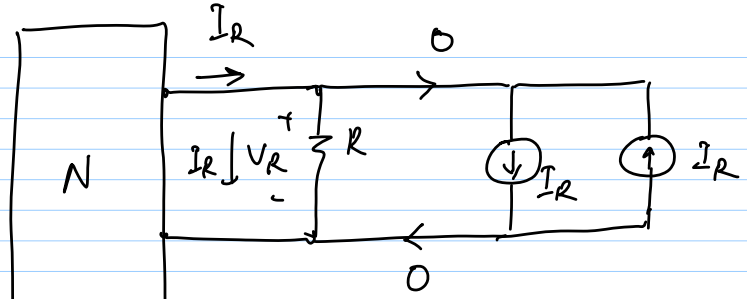
Circuit theorems

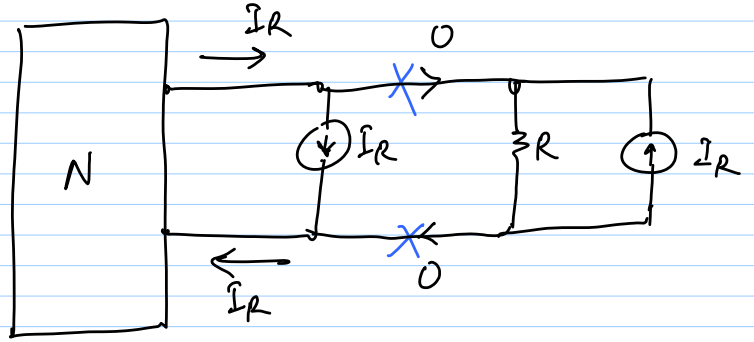


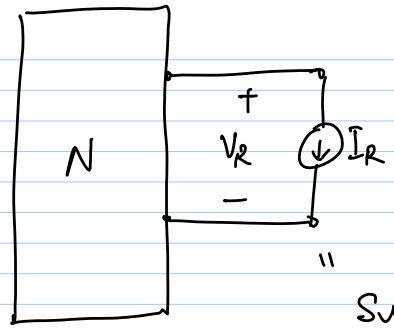


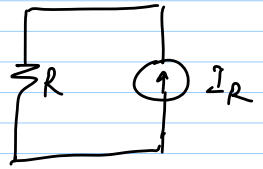












"Substitution Theorem"