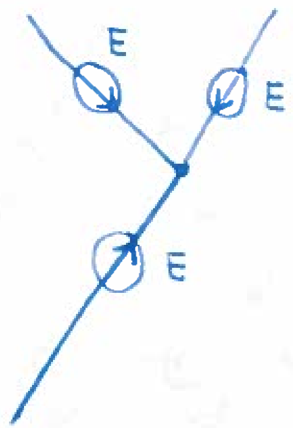
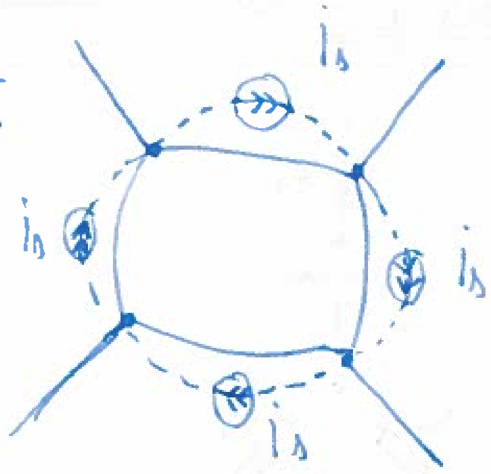
Vaschy 1 (2)

I



II

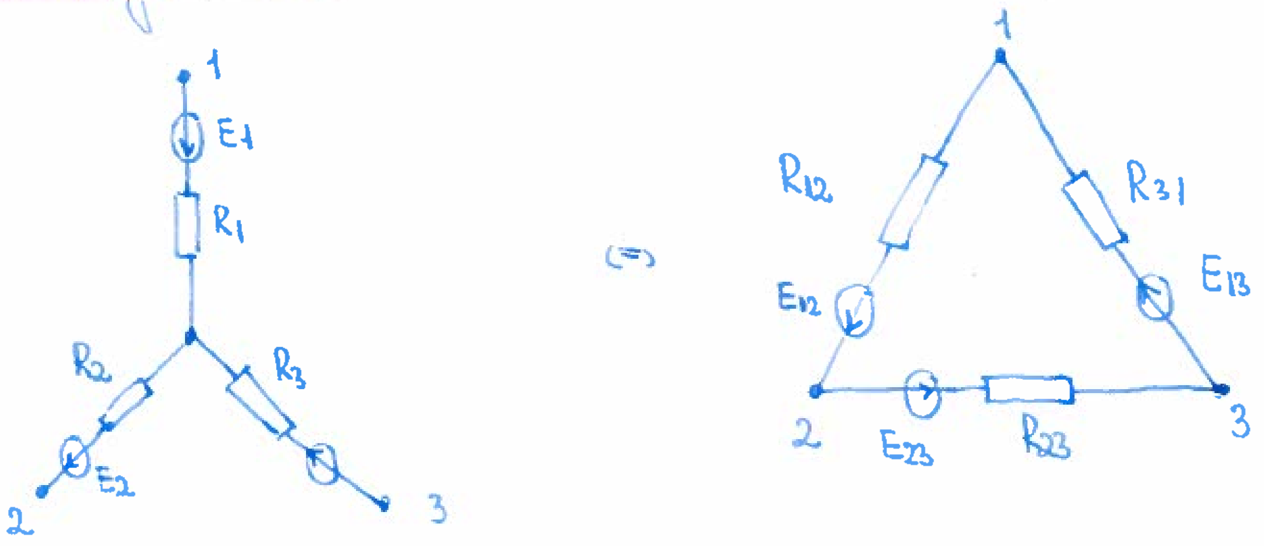


If we add (to all the branches connected to the node of a circuit, in series with the elements of both branches) voltage sources of the same value and with the same orientation with respect to the node, then the distribution of currents and voltages on all bipolar elements of the circuit will be not modified.

Vaschy 2:

If we add (or connect in parallel with all the branches that are part of the same loop) current sources with same values and with the same orientation related to an arbitrary one chosen for the loop, than the distribution of the currents and voltages for all the elements of the circuit will be not modified.

Star - Triangle / Triangle - Star Transformation (6)



$$R_1 = \frac{R_{12} \cdot R_{31}}{R_{12} + R_{23} + R_{31}} \qquad R_{23} = \frac{R_1 R_2 + R_2 R_3 + R_3 R_1}{R_1}$$

$$R_2 = \frac{R_{21} \cdot R_{23}}{R_{12} + R_{23} + R_{31}} \qquad R_{12} = \frac{R_1 R_2 + R_2 R_3 + R_3 R_1}{R_3}$$

$$R_3 = \frac{R_{23} \cdot R_{13}}{R_{12} + R_{23} + R_{31}} \qquad R_{13} = \frac{R_1 R_2 + R_2 R_3 + R_3 R_1}{R_2}$$

Bonus homework:

find out with active sources

The THEOREME of RECIPROCITY

If an ideal voltage source with a ct. value of the electromotive force E is placed in the branch BP and generates in the branch BQ a current i, then if we move the respective voltage source in the branch BQ it will generate the same current i in the branch BP.

input → output
bp → E bq → i

input → output
bq → E bp → i

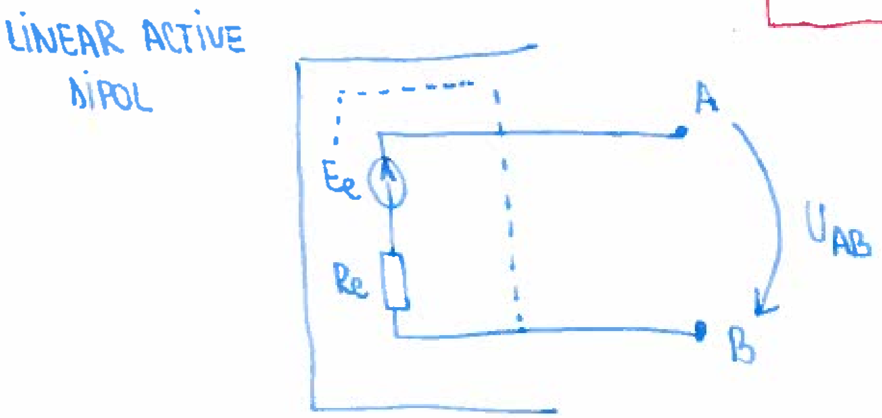
I The Theoremes of the equivalent generators (3) (Thevenin)

II The Theoreme of equivalent current generators (Norton)

I Any linear bipolar circuit can be replaced with an equivalent one (with respect to its terminals) containing a voltage source, that is real, with the voltage equal to the open circuit voltage with respect to the same terminal in series to its internal resistance equal to the total resistance of the passivised circuit with respect to the same terminals.

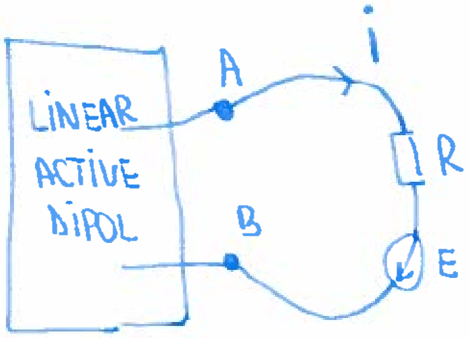
Under these conditions, the current provided by the dipol on an active branch of resistance R and voltage E can be written as

$$i = \frac{E_e \pm E}{R_e + R}$$



$E_e = U_{AB0}$

$R_e = R_{AB0}$



e.g.