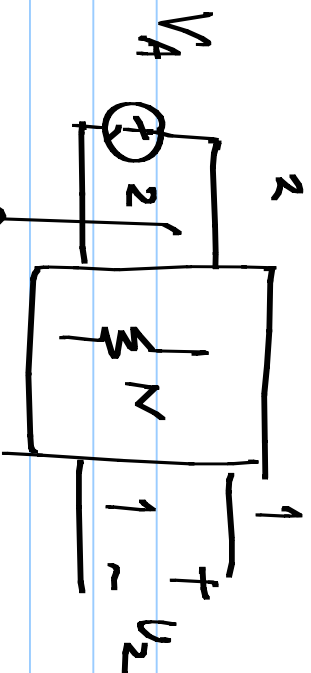


# EC1010: Lecture 16

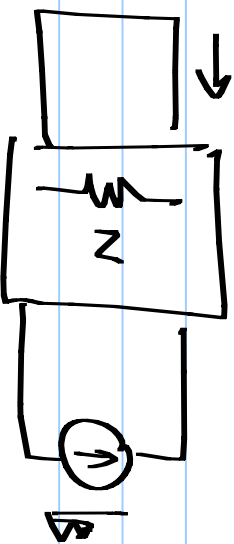
$$\begin{bmatrix} v_1 \\ v_2 \end{bmatrix} = \begin{bmatrix} h_{11} & h_{12} \\ h_{21} & h_{22} \end{bmatrix} \begin{bmatrix} i_1 \\ i_2 \end{bmatrix}$$

$$\begin{bmatrix} i_1 \\ i_2 \end{bmatrix} = \begin{bmatrix} g_{11} & g_{12} \\ g_{21} & g_{22} \end{bmatrix} \begin{bmatrix} v_1 \\ v_2 \end{bmatrix}$$



$$y_{12} = y_{21}$$

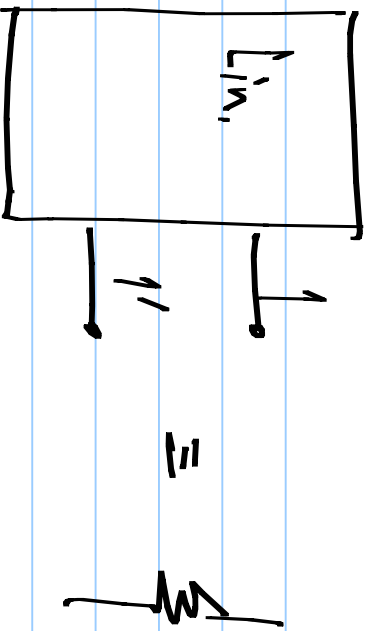
$$z_{12} = z_{21}$$



$$h_{21} = -h_{12} \frac{v_1}{v_2}$$

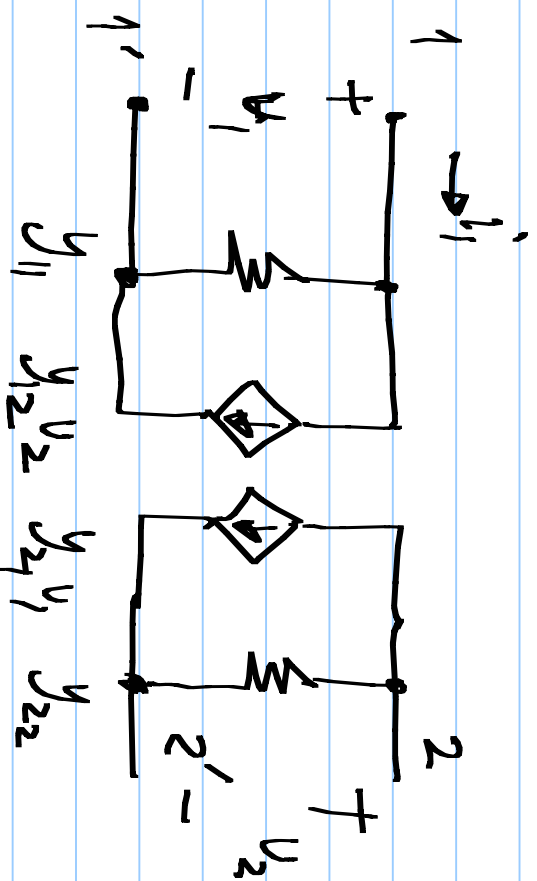
$$\frac{v_2}{v_A} = -\frac{i_1}{i_A}$$

$$g_{21} = -g_{12}$$

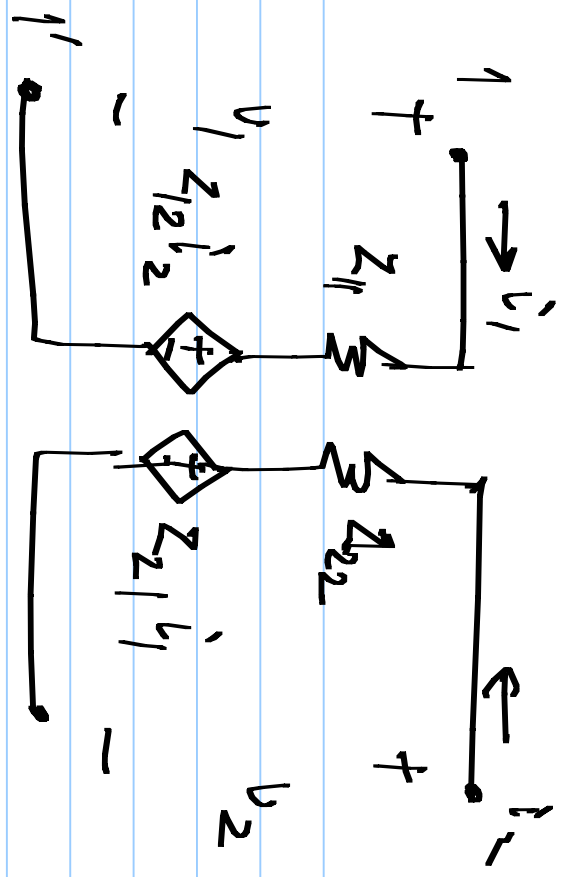


$$\begin{bmatrix} v_1 \\ i_2 \end{bmatrix} = \begin{bmatrix} y_{11} & y_{12} \\ y_{21} & y_{22} \end{bmatrix} \begin{bmatrix} v_1 \\ v_2 \end{bmatrix}$$

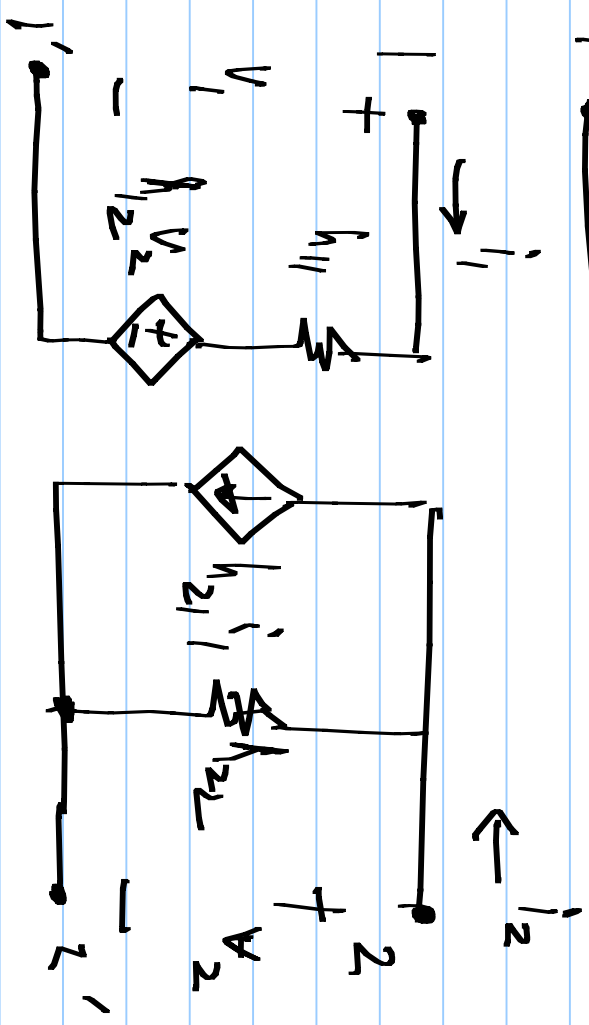
$$i_1 = \underline{y_{11} v_1} + \underline{y_{12} v_2}$$

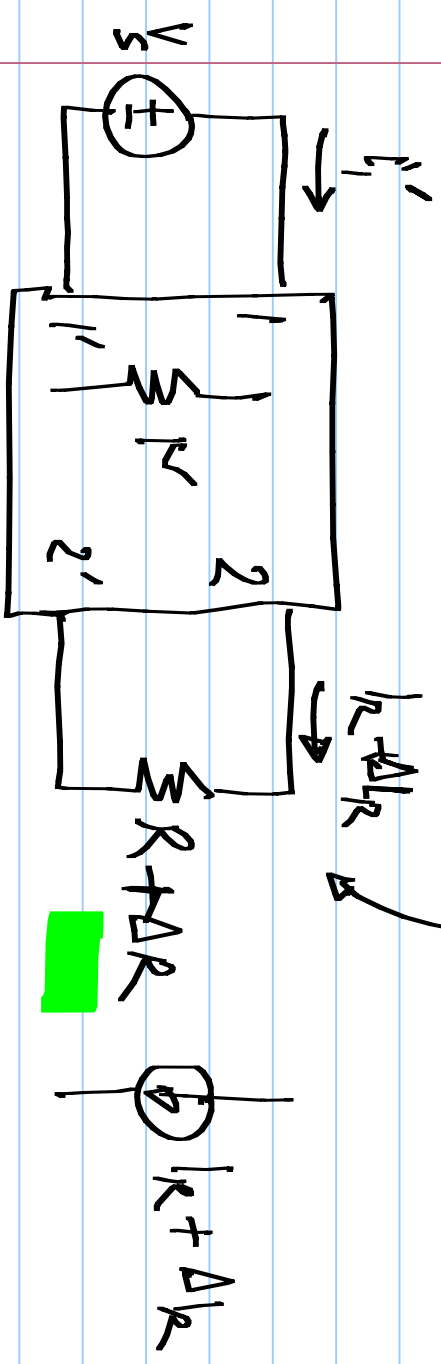
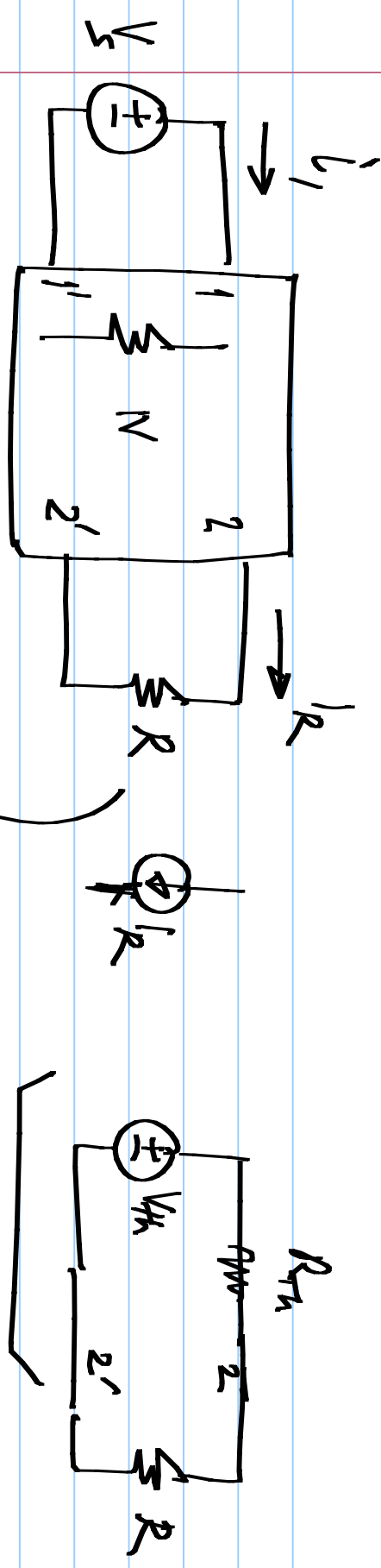


$$\begin{bmatrix} V_1 \\ V_2 \end{bmatrix} = \begin{bmatrix} Z_{11} & Z_{12} \\ Z_{21} & Z_{22} \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \end{bmatrix}$$

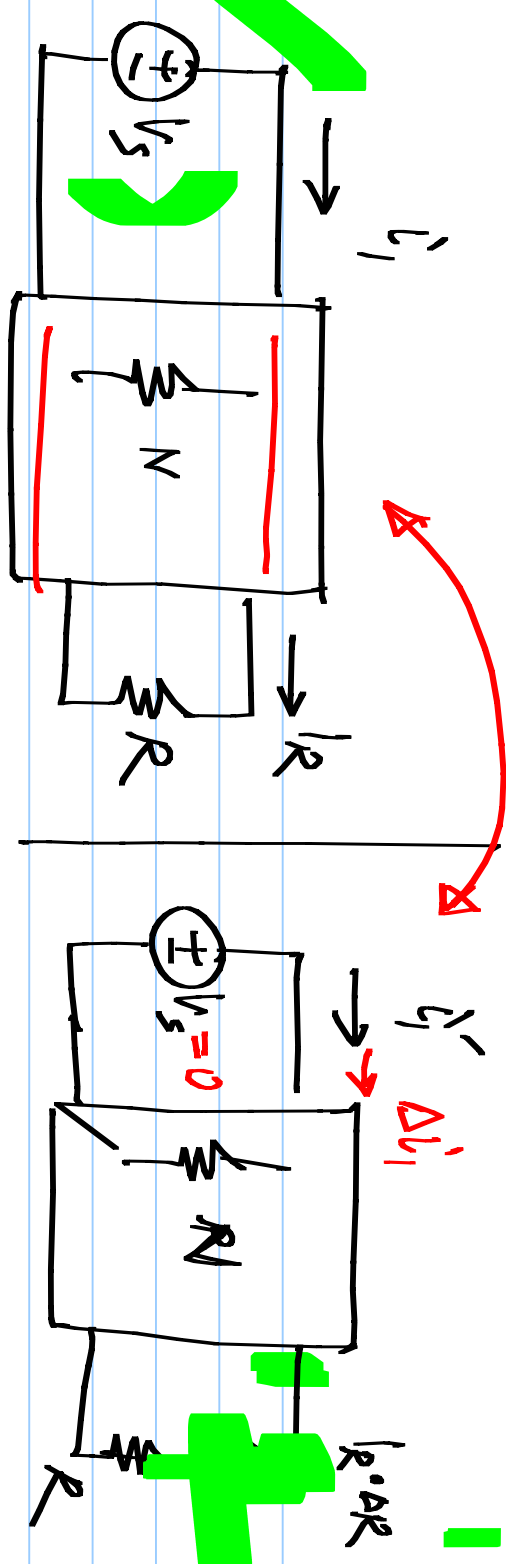


$$\begin{bmatrix} A \\ I_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} h_{11} & h_{12} \\ h_{21} & h_{22} \end{bmatrix} \begin{bmatrix} V_1 \\ V_2 \end{bmatrix}$$



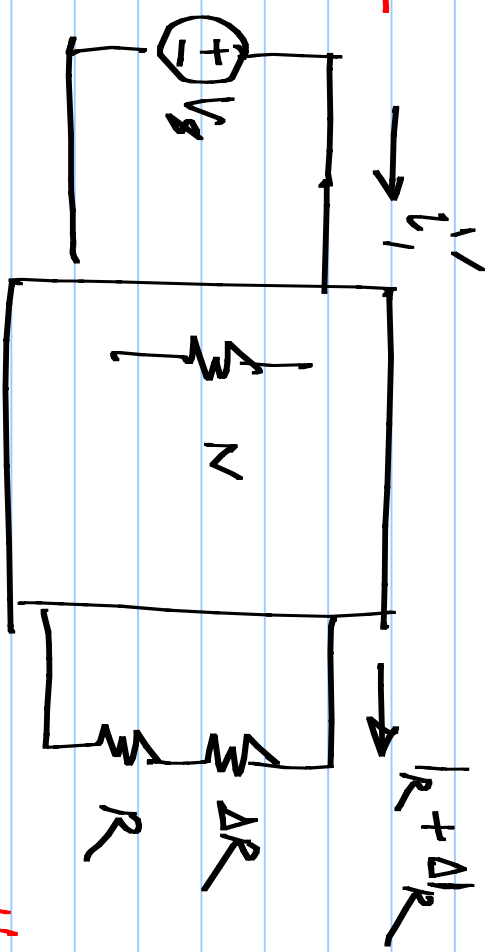


known:



$$\frac{\Delta i_1}{i_1} = \frac{-i_1}{V_s} \cdot \frac{R \cdot \Delta R}{R}$$

$$\Delta i_1 = -\frac{i_1}{V_s} \cdot \Delta R$$



$$(R + \Delta R) \cdot \Delta R \approx R \cdot \Delta R$$

Compensation theorem