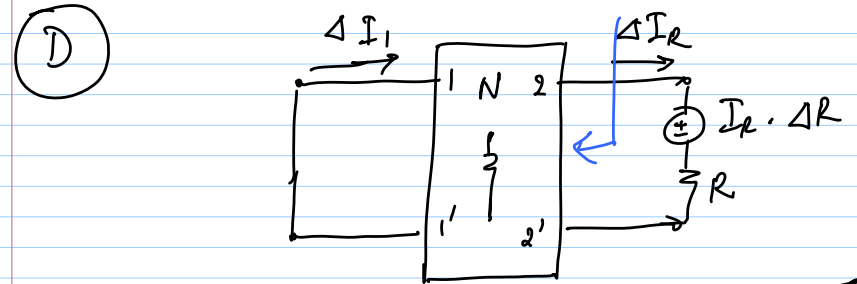
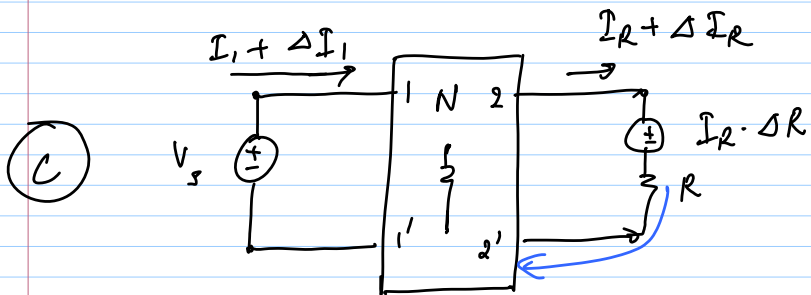
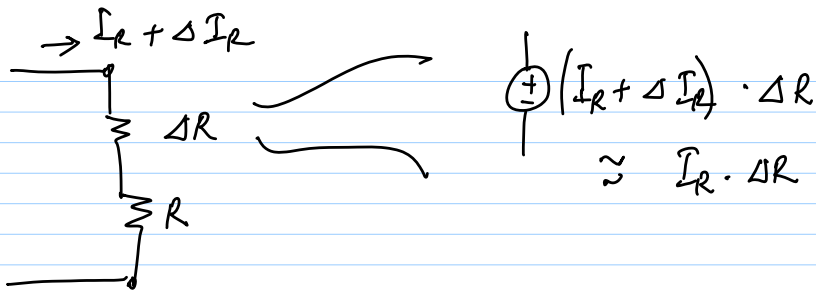
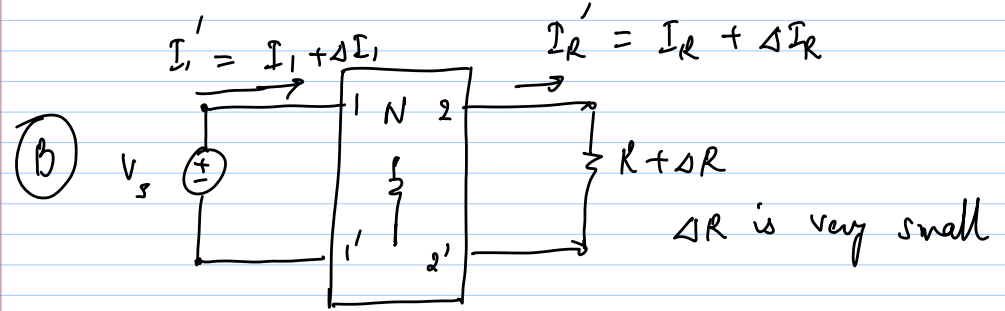
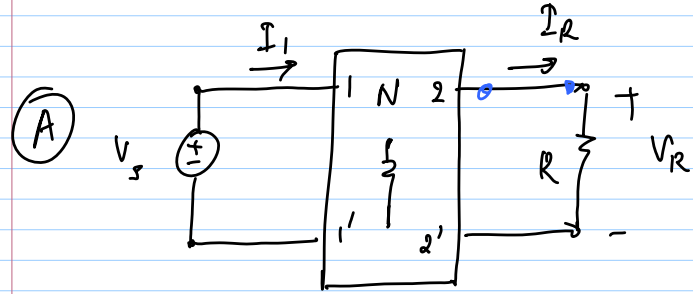
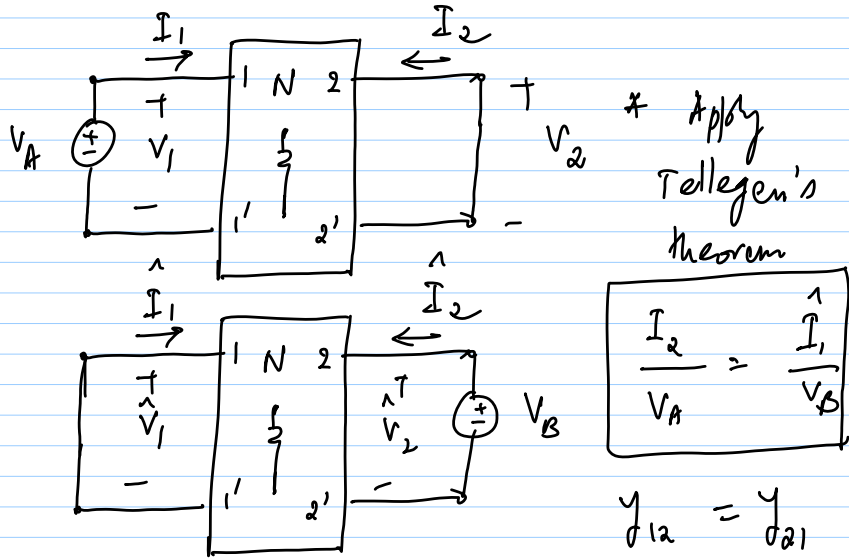


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Lec 17



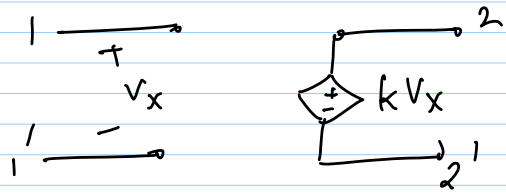
apply reciprocity between (A) & (D)

$$\frac{I_R}{V_s} = - \frac{\Delta I_1}{I_R \cdot \Delta R}$$

$$\Delta I_1 = - \frac{I_R^2}{V_s} \cdot \Delta R$$

Compensation Theorem

ideal VCVS



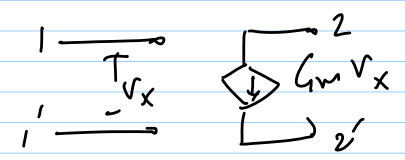
Y-param. X
 Z - X
 H - X
 a - ✓

$$[G] = \begin{bmatrix} 0 & 0 \\ k & 0 \end{bmatrix}$$

→ non-reciprocal
 → unilateral

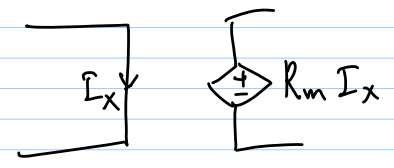
$$\begin{bmatrix} i_1 \\ i_2 \end{bmatrix} = \begin{bmatrix} g_{11} & g_{12} \\ g_{21} & g_{22} \end{bmatrix} \begin{bmatrix} v_1 \\ v_2 \end{bmatrix}$$

ideal VCCS



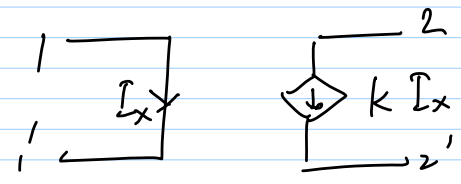
$$Y = \begin{bmatrix} 0 & 0 \\ G_m & 0 \end{bmatrix}$$

ideal CCCS

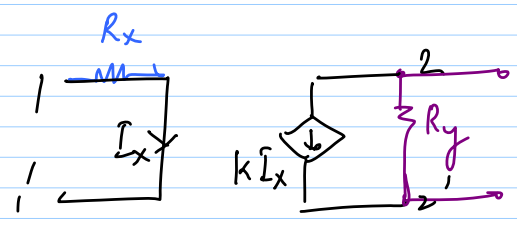


$$Z = \begin{bmatrix} 0 & 0 \\ R_m & 0 \end{bmatrix}$$

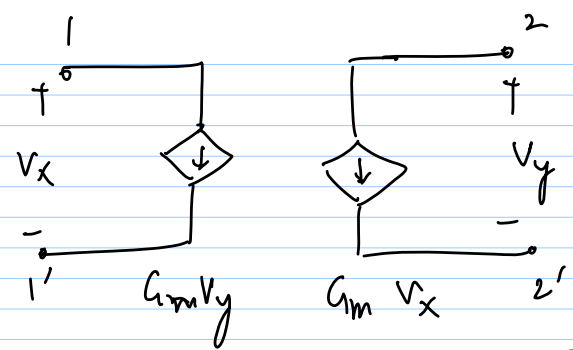
ideal CCCS



$$H = \begin{bmatrix} 0 & 0 \\ k & 0 \end{bmatrix}$$



$$H = \begin{bmatrix} R_x & 0 \\ k & 1/R_y \end{bmatrix}$$



$$Y = \begin{bmatrix} 0 & G_m \\ G_m & 0 \end{bmatrix}$$