



easyPOLI

# Es Parametri 3

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A project By

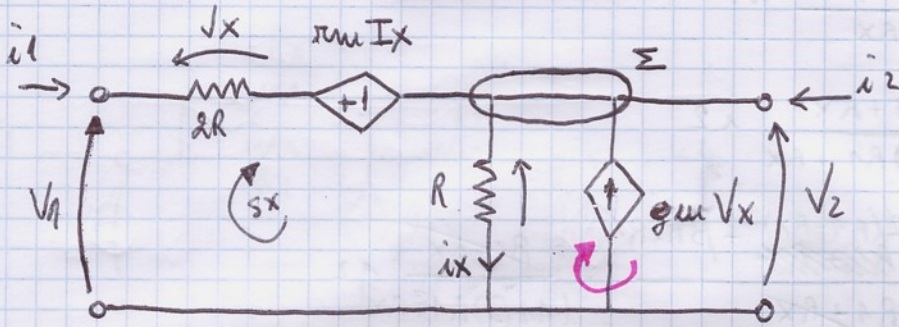
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$$DB_R \begin{cases} V_1 = f(i_1, i_2) \\ V_2 = f(i_1, i_2) \end{cases}$$

KVL Sx)  $V_1 - V_x - gmIx - Rix = 0$

$$V_1 = V_x + (gm + R)ix$$

KCL Σ)  $i_1 + i_2 + gmV_x = ix$

KVL Dx)  $V_2 = Rix$

NB  $\Rightarrow i_1 = \frac{V_x}{2R} \rightarrow V_x = 2Ri_1$

$$\Rightarrow i_1 + i_2 + gm 2Ri_1 = ix$$

$$\Rightarrow ix = (1 + gm 2R)i_1 + i_2$$

$$\Rightarrow V_1 = 2Ri_1 + (gm + R) [(1 + gm 2R)i_1 + i_2]$$

$$V_1 = 2Ri_1 + (gm + R)(1 + gm 2R)i_1 + (gm + R)i_2$$

$$R_{11} = \{ 2R + (gm + R)(1 + gm 2R) \}$$

$$R_{12} = \{ gm + R \}$$

$$V_2 = Rix \Rightarrow V_2 = R(1 + gm 2R)i_1 + Ri_2$$

$$R_{21} = R(1 + gm 2R)$$

$$R_{22} = R$$

$$\begin{bmatrix} 2R + (gm + R)(1 + gm 2R) & gm + R \\ R(1 + gm 2R) & R \end{bmatrix} R$$