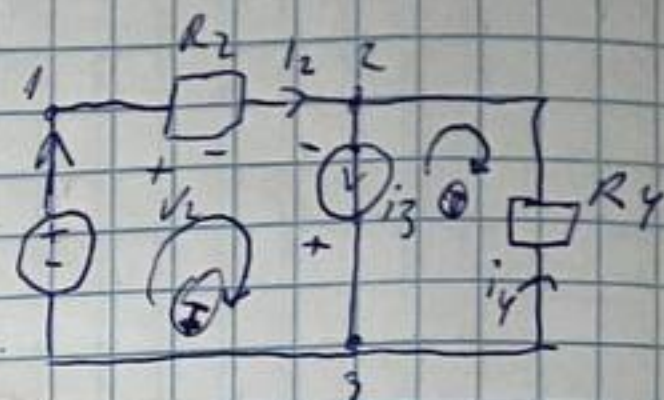


N 1.1.1.



$$V_1 = 3$$

$$R_2 = 1$$

$$i_3 = 6$$

$$R_4 = 2$$

$$N_{3in} = N_4 - 1 = 2 - 1 = 1$$

$$N_{3in} = N_6 - N_4 + 1 = 3 - 2 + 1 = 2$$

$$N_{3in} = N_{3in} + N_{3in} = 1 + 2 = 3$$

$$\text{3 K: (I): } -V_1 + V_2 - V_3 = 0$$

$$\text{(II): } -V_4 + V_3 = 0$$

$$\text{3 K: (2): } -i_2 + i_3 - i_4 = 0$$

3 K: (1):

$$V_2 = i_2 R_2 = i_2$$

$$V_4 = i_4 R_4 = 2i_4$$

$$\begin{cases} -3 + i_2 - V_3 = 0 \\ V_3 - 2i_4 = 0 \\ -i_2 + 6 - i_4 = 0 \end{cases} \Rightarrow \begin{cases} i_2 - 2i_4 = 3 \\ -i_2 - i_4 = -6 \\ V_3 = 2i_4 \end{cases} \Rightarrow \begin{cases} -3i_4 = -3 \\ i_4 = -i_4 + 6 \\ V_3 = 2i_4 \end{cases}$$

$$\Rightarrow \begin{cases} i_4 = 1A \\ i_2 = 6 - 1 = 5A \\ V_3 = 2 \cdot 1 = 2V \end{cases} \Rightarrow \begin{cases} V_2 = 5V \\ V_4 = 2V \end{cases}$$

$$P_1 = -i_1 V_1 = -5 \cdot 3 = -15W$$

$$P_2 = i_2 V_2 = 5 \cdot 5 = 25W$$

$$P_3 = -i_3 V_3 = -6 \cdot 2 = -12W$$

$$P_4 = i_4 V_4 = 1 \cdot 2 = 2W$$

$$\Rightarrow \sum P_k = -15 + 25 - 12 + 2 = 0W$$

Summierung

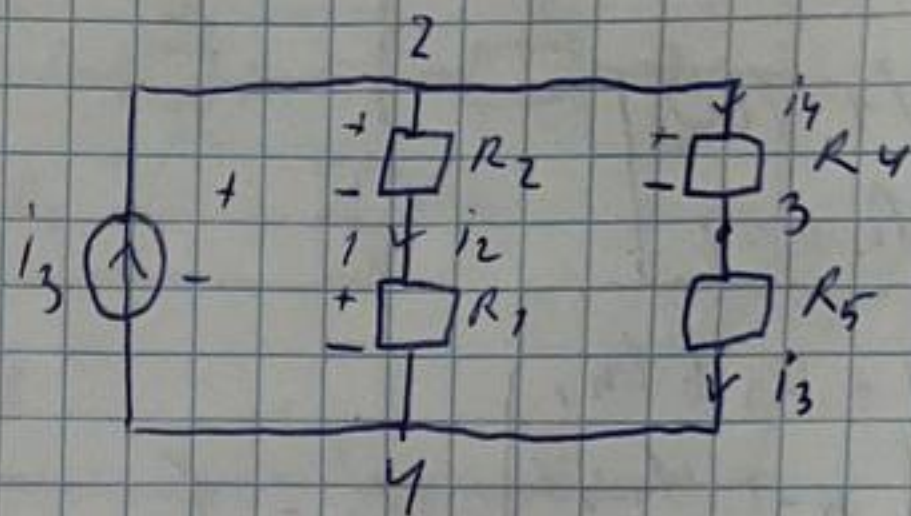
N	1	2	3	4
i_A	5	5	6	1
V	3	5	2	2
P_{W}	-15	25	-12	2

№ 1.1.2.

$$R_K = 1 \quad \text{ФДТ}$$

$$i_3 = 10 \quad i_1 = i_2 = \frac{R_5 + R_4}{R_5 + R_4 + R_3 + R_2} i_3 =$$

$$i_K = 1 \quad R_{bn} = 1 = \frac{2}{4} \cdot 10 = 5A.$$



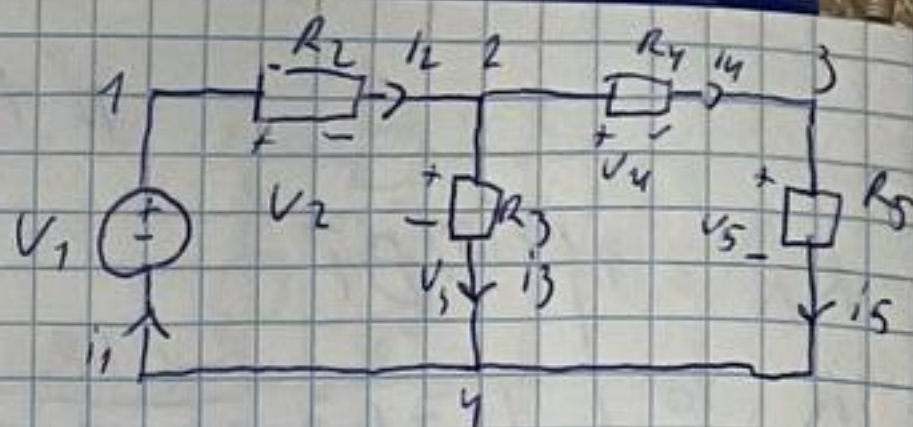
$$i_3 = i_4 = \frac{R_1 + R_2}{R_1 + R_2 + R_3 + R_4} i_3 = \frac{2}{4} \cdot 10 = 5A.$$

$$R_{bn} = \frac{(R_1 + R_2)(R_3 + R_4)}{R_1 + R_2 + R_3 + R_4} = \frac{2 \cdot 2}{2 + 2} = 2 \Omega$$

Ответ: $i_1 = i_2 = i_3 = i_4 = 5A.$

$R_{bn} = 2 \Omega.$

1.1.4.



$$V_1 = 110$$

$$R_k = 4$$

$$i_5, V_3, G_{kn}$$

$$C_{k-1}, H_{k-1}$$

$$V_5' = 1$$

$$i_5' = \frac{V_5'}{R_5} = \frac{1}{4}$$

$$i_4' = i_5' = \frac{1}{4}$$

$$V_4' = i_4' R_4 = \frac{1}{4} \cdot 4 = 1$$

$$V_3' = V_4' + V_5' = 1 + 1 = 2$$

$$i_3' = \frac{V_3'}{R_3} = \frac{2}{4} = \frac{1}{2}$$

$$i_2' = i_3' = i_4' + i_5' = \frac{1}{2} + \frac{1}{4} = \frac{3}{4}$$

$$V_2' = i_2' R_2 = \frac{3}{4} \cdot 4 = 3$$

$$V_1' = V_2' + V_3' = 3 + 2 = 5$$

$$k = \frac{V_1}{V_1'} = \frac{110}{5} = 22$$

$$i_5 = k i_5' = 22 \cdot \frac{1}{4} = 5.5 \text{ A}$$

$$V_3 = k V_3' = 22 \cdot 2 = 44 \text{ V}$$

$$G_{kn} = \frac{i_5'}{V_1'} = \frac{\frac{1}{4}}{5} = \frac{1}{20} = 0.05 \text{ S}$$

$$C_{5-1} = \frac{i_5'}{V_1'} = \frac{\frac{1}{4}}{5} = 0.05 \text{ S}$$

$$H_{V3-1} = \frac{V_3'}{V_1'} = \frac{2}{5} = 0.4$$

$$\text{Order: } i_5 = 5.5 \text{ A} \quad V_3 = 44 \text{ V}$$

$$G_{kn} = 0.05 \text{ S} \quad C_{5-1} = 0.05 \text{ S}$$

$$H_{V3-1} = 0.4$$

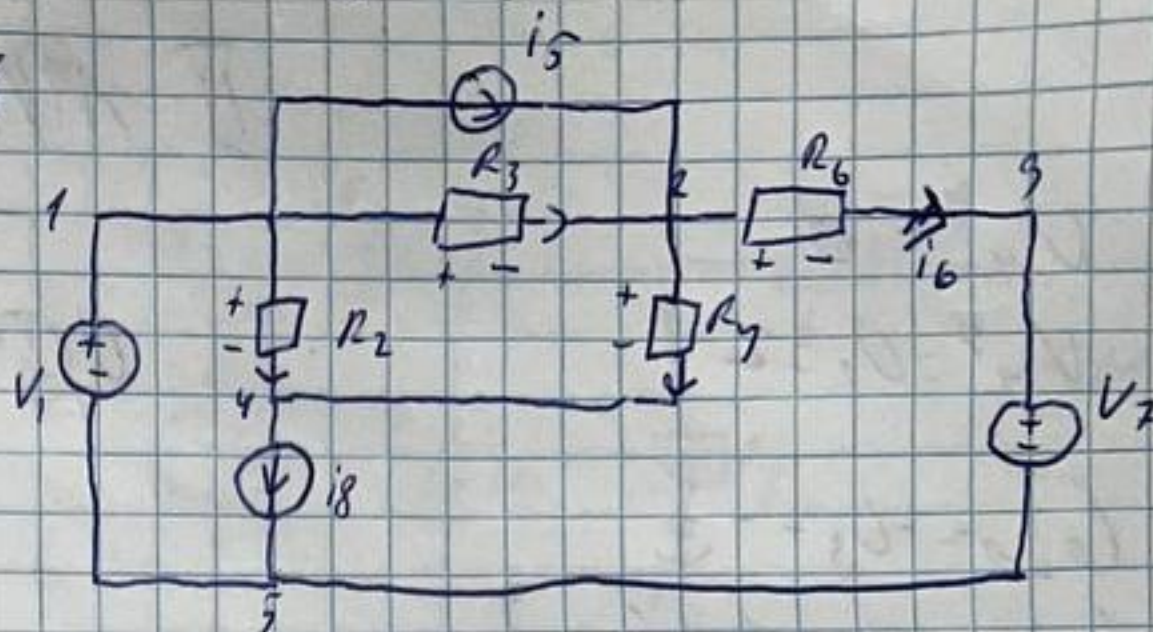
N 1.16

$$R_4 = 2$$

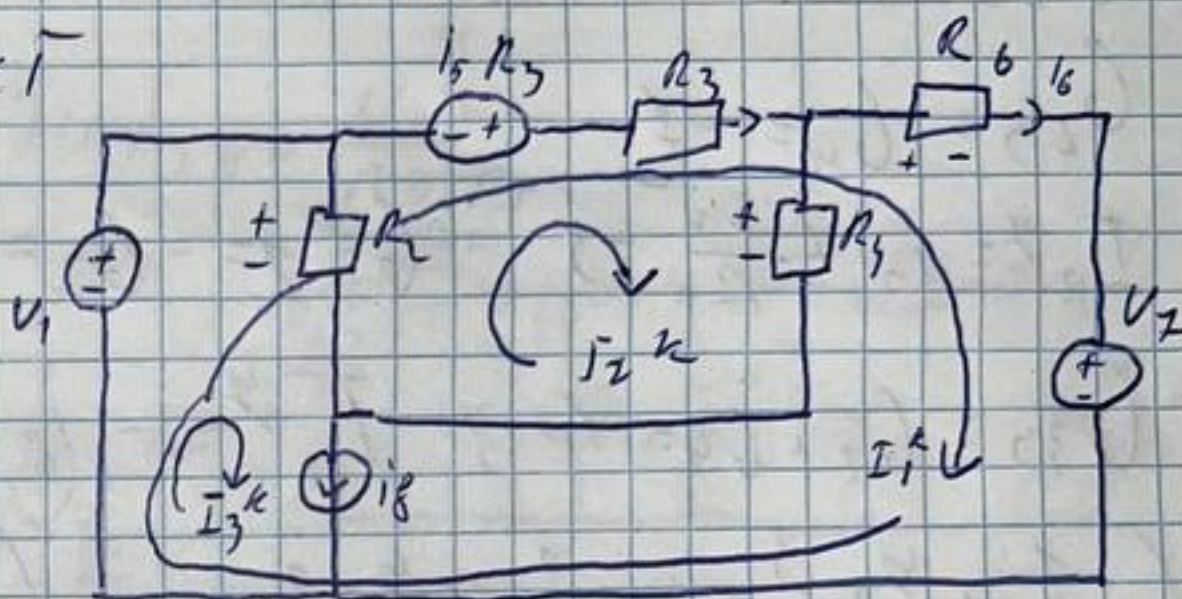
$$V_1 = V_2 = 2$$

$$i_5 = i_8 = 2$$

$$i_6 = ?$$



$[Mk]$



$$I_3^k = i_8 = 2$$

$$R_{11} = R_2 + R_3 + R_6 = 4$$

$$R_{12} = R_3 = 2$$

$$R_{13} = 0$$

$$R_{21} = R_{12} = 2$$

$$R_{22} = R_2 + R_3 + R_4 = 6 ; R_{23} = -R_2 = -2$$

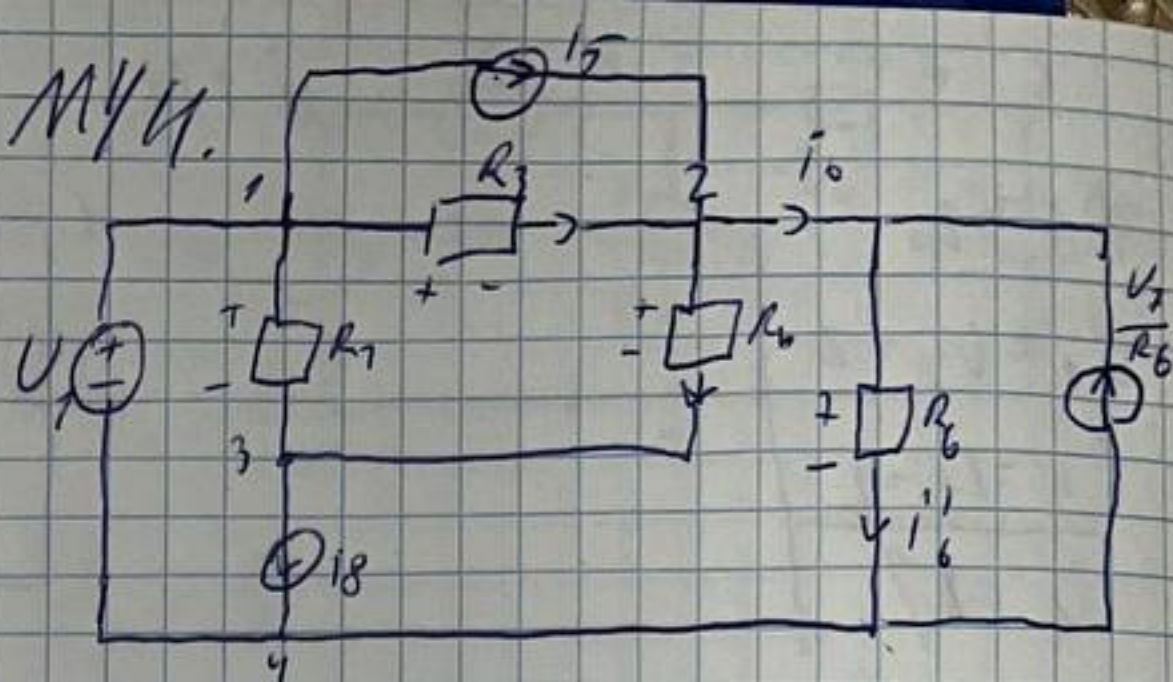
$$V_1^k = V_1 + i_6 R_3 = V_2 = 2 + 4 - 2 = 4 ; V_2^k = i_5 R_3 = 4$$

$$\begin{cases} 4I_1^k + 2I_2^k = 4 \\ 2I_1^k + 6I_2^k - 2I_3^k = 4 \\ I_3^k = 2 \end{cases} \Rightarrow \begin{cases} 2I_1^k + I_2^k = 2 \\ I_1^k + 3I_2^k = 4 \\ I_3^k = 2 \end{cases} \Rightarrow$$

$$\Rightarrow \begin{cases} 5I_1^k = 2 \\ I_2^k = 2 - 2I_1^k \\ I_3^k = 2 \end{cases} \Rightarrow \begin{cases} I_1^k = 0,4 \\ I_2^k = 1,2 \\ I_3^k = 2 \end{cases} \quad i_6 = 0,4A$$

Or let $i_6 = 0,4A$.

II M44.



$$U_4^y = 0$$

$$U_4^y = U_1 = 2$$

$$G_{21} = -G_3 = -\frac{1}{2}$$

$$G_{22} = G_3 + G_4 + G_6 = \frac{3}{2}$$

$$G_{23} = -G_4 = -\frac{1}{2}$$

$$I_2^y = I_5 + \frac{U_2}{R_6} = 3, \quad G_{31} = -G_2 = -\frac{1}{2}, \quad G_{32} = G_{23} = -\frac{1}{2}$$

$$G_{33} = G_2 + G_4 = 1, \quad I_1^y = -I_8 = -2$$

$$\begin{cases} -\frac{1}{2}U_1^y + \frac{3}{2}U_2^y - \frac{1}{2}U_3^y = 3 \\ -\frac{1}{2}U_1^y - \frac{1}{2}U_2^y + U_3^y = -2 \end{cases} \Rightarrow \begin{cases} \frac{3}{2}U_2^y - \frac{1}{2}U_3^y = 4 \\ -\frac{1}{2}U_2^y + U_3^y = -1 \end{cases} \Rightarrow$$

$$U_4^y = 2$$

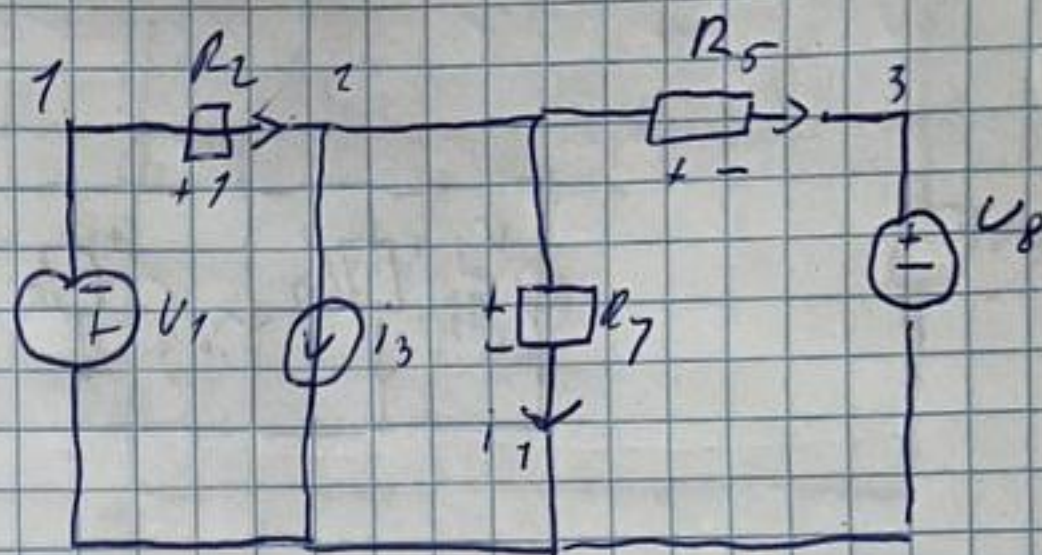
$$\Rightarrow \begin{cases} \frac{5}{2}U_3^y = 1 \\ U_2^y = 2(1 + U_3^y) \end{cases} \Rightarrow \begin{cases} U_3^y = 0.4 \\ U_2^y = 2.8 \end{cases}$$

$$i_6 = i_6' - \frac{U_2}{R_6} = \frac{U_2^y - U_4^y}{R_6} - \frac{U_2}{R_6} = \frac{2.8 - 0 - 2}{2} = 0.4 \text{ A.}$$

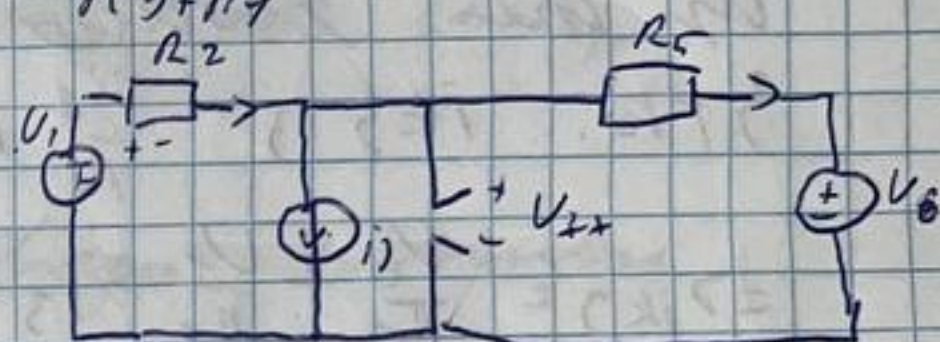
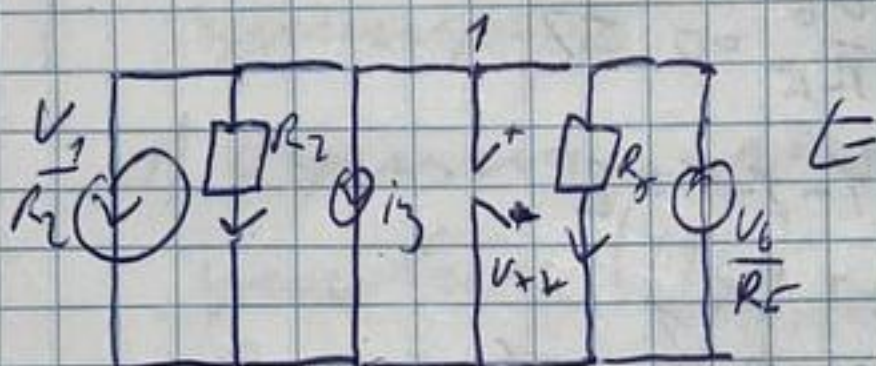
Answer: $i_6 = 0.4 \text{ A.}$

N 1.1.2.

$$\begin{aligned} V_1 &= 2 \\ R_2 &= 2 \\ i_3 &= 1 \\ R_4 &= 1 \\ R_5 &= 2 \\ V_6 &= 8 \\ i_4 &=? \end{aligned}$$



$$I_{M3UV} i_4 = \frac{V_{xx}}{R_2 + R_4}$$

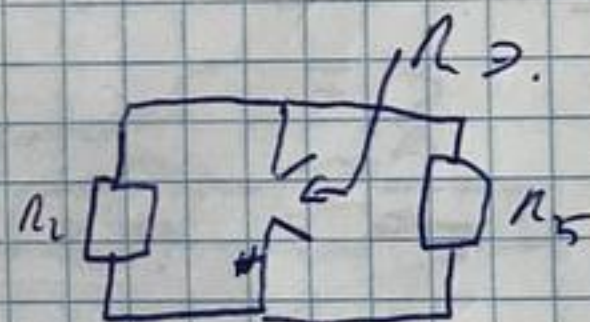


$$V_2^y = 0, \quad (G_2 + G_5) V_1^y = \frac{V_6}{R_5} - i_3 - \frac{V_1}{R_2} \Rightarrow$$

$$\Rightarrow V_1^y = \frac{4 - 1 - 1}{\frac{1}{2} + \frac{1}{2}} = 2$$

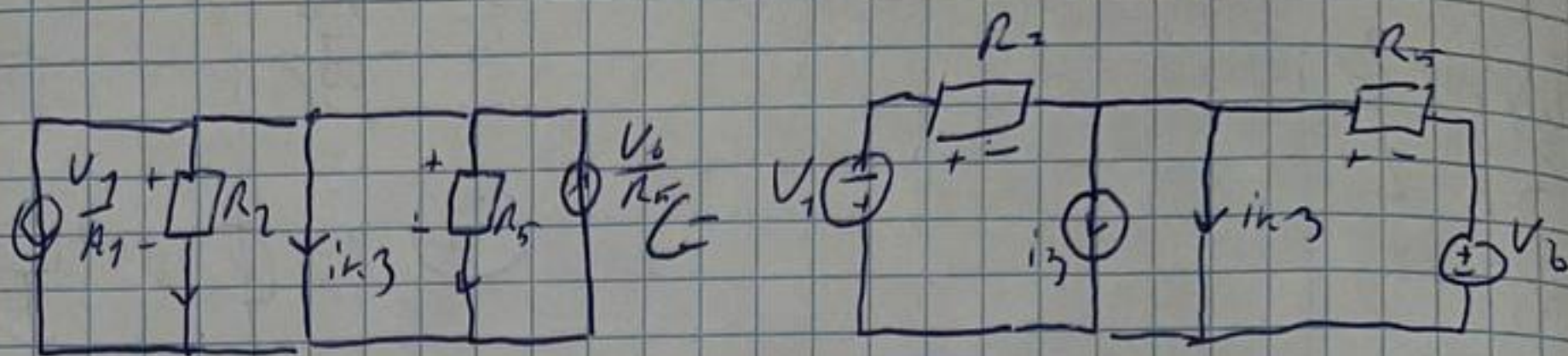
$$V_{xx} = V_1^y - V_2^y = 2$$

$$R_3 = ? \quad R_3 = \frac{R_2 R_5}{R_2 + R_5} = \frac{2 \cdot 2}{2 + 2} = 1$$



$$i_4 = \frac{2}{1 + 1} = 1$$

$$\text{II MOUT } i_y = \frac{64 \text{ k}\Omega}{62 + 64}$$



Т.к. k_{21} то б. н.м. Нет-н.м. негизден, негизден

из этих новых данных следует, что

$$3) \text{TK: } -ik_3 - i_3 - \frac{U_1}{R} + \frac{U_6}{R_5} = 0 \Rightarrow$$

$$\Rightarrow i_k = \frac{V_0}{R_5} - \frac{V_1}{R_1} - i_3 = 4 - 1 - 1 = 2$$

$$G_D = \frac{1}{R_D} = 1$$

$$G_4 = \frac{1}{n_4} = 1$$

$$14 = \frac{1 \cdot 2}{171} = (7)$$