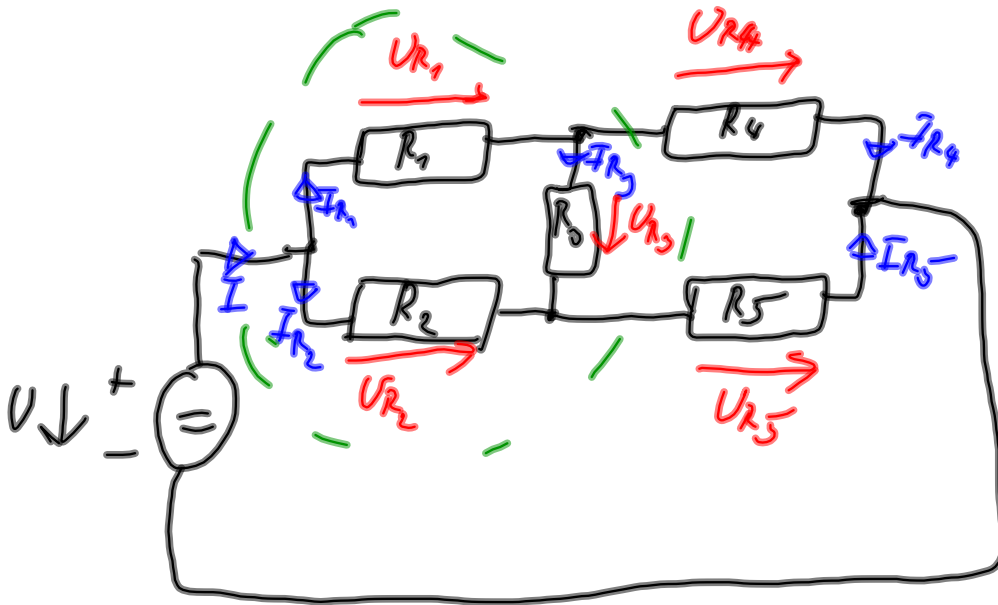
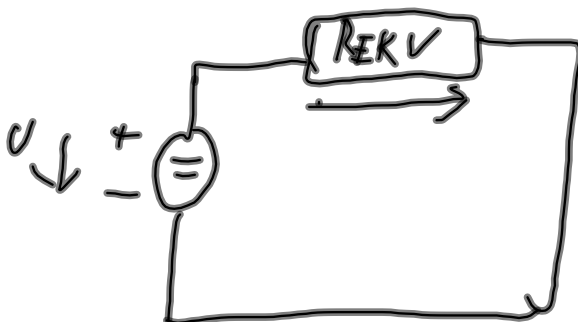


IFLe 29.9.
2nd lecture

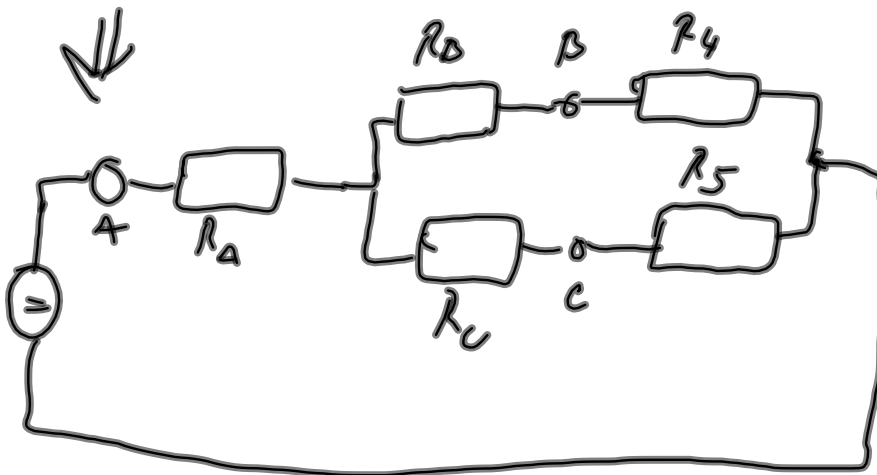
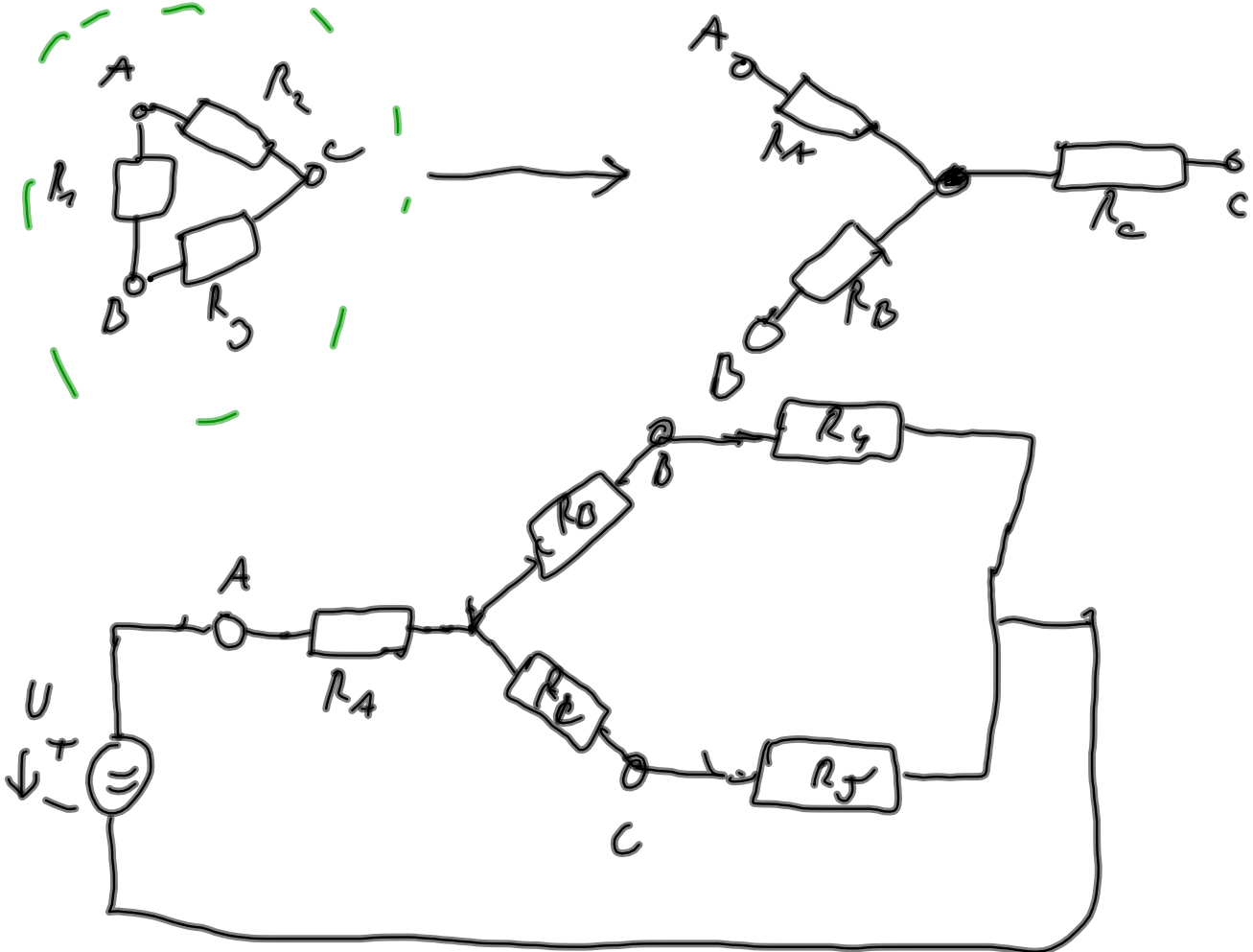


SOLVE THIS CIRCUIT - CALCULATE
ALL CURRENTS
VOLTAGES

RESULT:

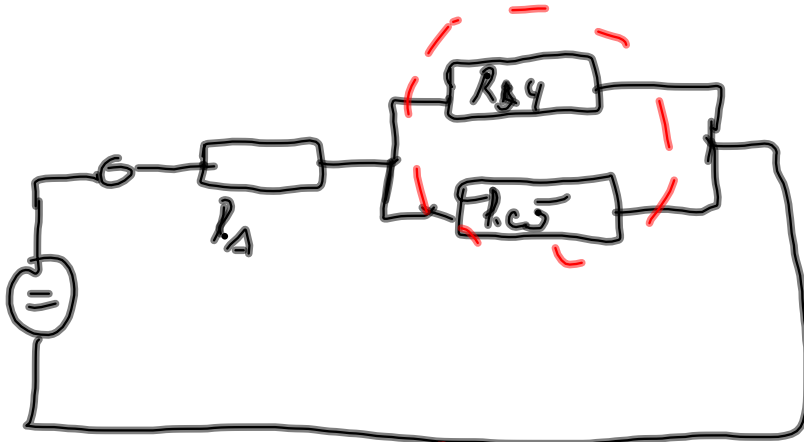


$\Delta \rightarrow \star$ TRANSFORMATION

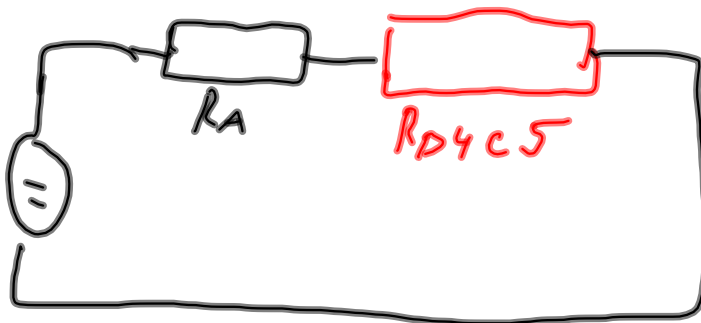


$$R_{D4} = R_0 + R_4$$

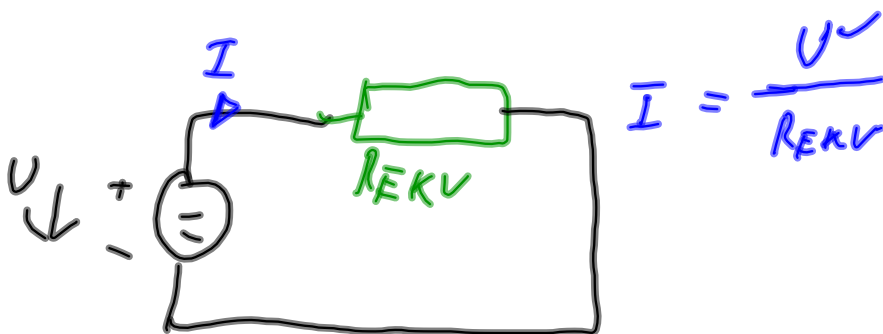
$$R_{C5} = R_c + R_5$$



$$R_{D4C5} = \frac{R_{B4} \cdot R_{C5}}{R_{B4} + R_{C5}}$$

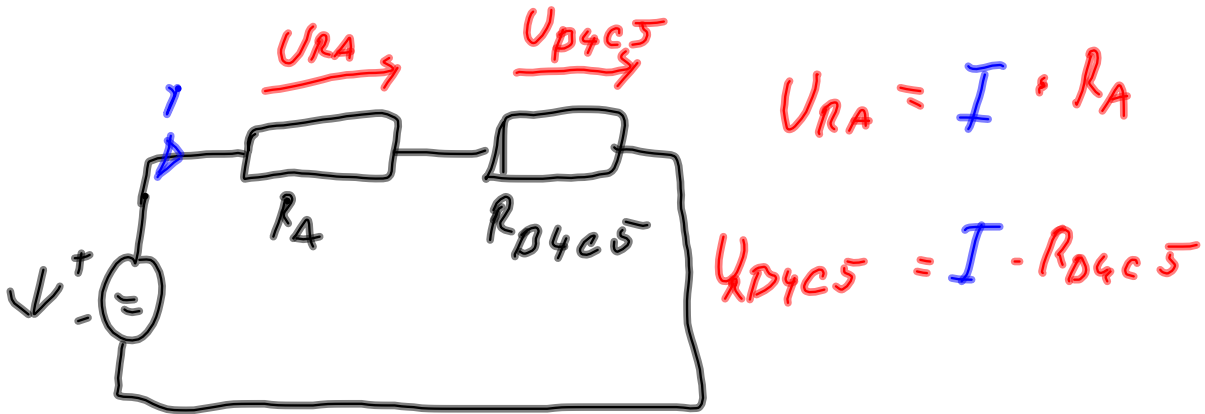


$$R_{EKV} = R_A + R_{D4C5}$$



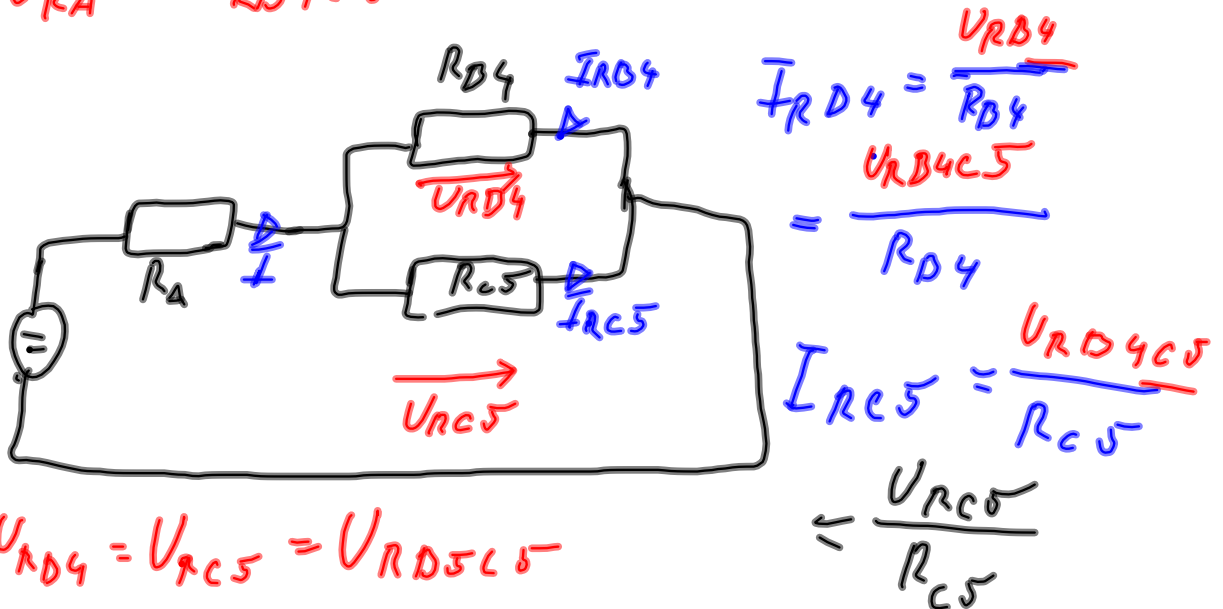
$$I = \frac{U}{R_{EKV}}$$

TO CALCULATE REMAINING VOLTAGES AND CURRENTS, WE HAVE TO GO BACKWARDS.



CHECK: II. KIRCHOFF'S LAW (KL)

$$U_{RA} + U_{B4C5} - U = 0$$

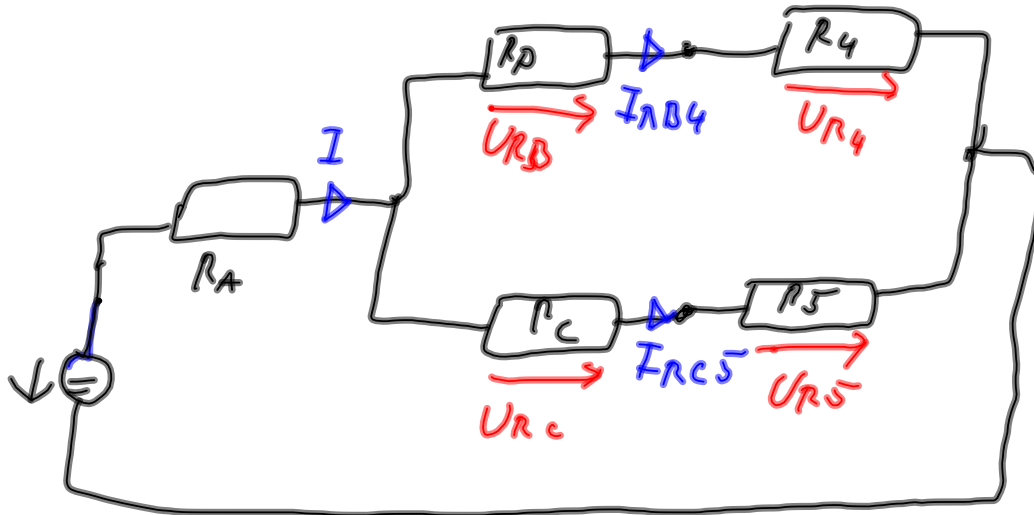


$$U_{RB4} = U_{RC5} = U_{B4C5}$$

CHECK

I. KL

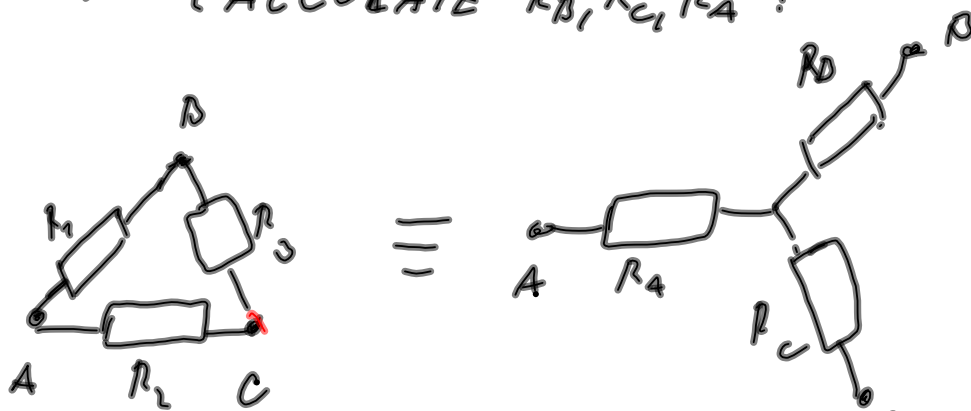
$$I - I_{RB4} - I_{RC5} = 0$$



$$U_{RB} = I_{RB4} \cdot R_B \quad U_{R4} = I_{RB4} \cdot R_4$$

$$U_{RC} = I_{RC5} \cdot R_C \quad U_{R5} = I_{RC5} \cdot R_5$$

HOW TO CALCULATE R_B, R_C, R_A ?



KNOW R_1, R_2, R_3
 UNKNOWN R_A, R_B, R_C

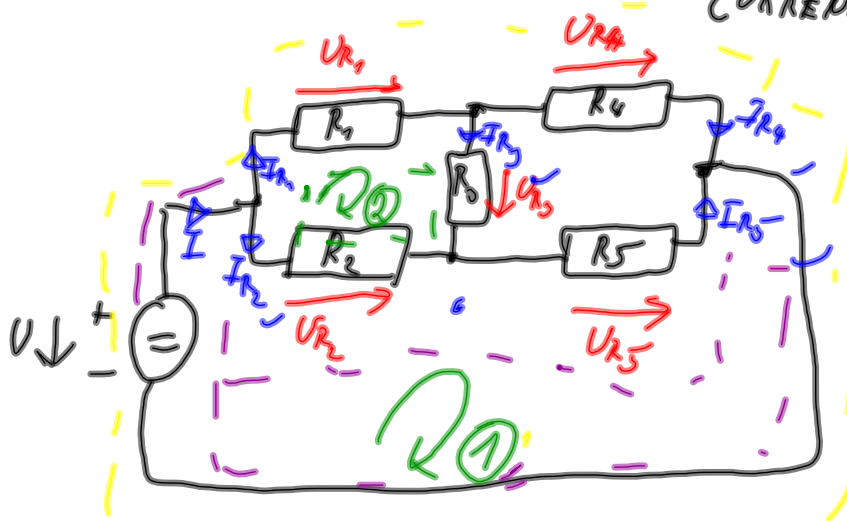
$R_A = \frac{\text{PRODUCT OF CONN. TO A}}{\text{SUM OF ALL}}$

$$R_A = \frac{R_1 \cdot R_2}{R_1 + R_2 + R_3}$$

$$R_B = \frac{R_1 \cdot R_3}{R_1 + R_2 + R_3}$$

$$R_C = \frac{R_2 \cdot R_3}{R_1 + R_2 + R_3}$$

CALCULATION OF THE REMAINING VOLTAGES, CURRENTS



II. kL.

$$\textcircled{1} \quad \underline{U_{R_2}} + U_{R_5} - U = 0$$

$$U_{R_2} = U - U_{R_5}$$

$$\underline{U_{R_1}} + U_{R_4} - U = 0$$

$$U_{R_1} = U - U_{R_4}$$

$$\textcircled{2} \quad U_{R_1} + \underline{U_{R_3}} - U_{R_2} = 0$$

$$U_{R_3} = U_{R_2} - U_{R_1}$$

OHM'S LAW

$$I_{R_1} = \frac{U_{R_1}}{R_1} \quad I_{R_2} = \frac{U_{R_2}}{R_2} \quad I_{R_3} = \frac{U_{R_3}}{R_3}$$

CHECK: I. KL

$$I_{R_1} = I_{R_3} + I_{R_4}$$

$$I_{R_1} + I_{R_2} - I_{R_3}$$

HOMEWORK

$$R_1 = 200 \Omega, R_2 = 300 \Omega,$$

$$R_3 = 500 \Omega, R_4 = 100 \Omega,$$

$$R_5 = 50 \Omega, U = \left. \begin{array}{l} 16 \\ 32 \end{array} \right\} V$$