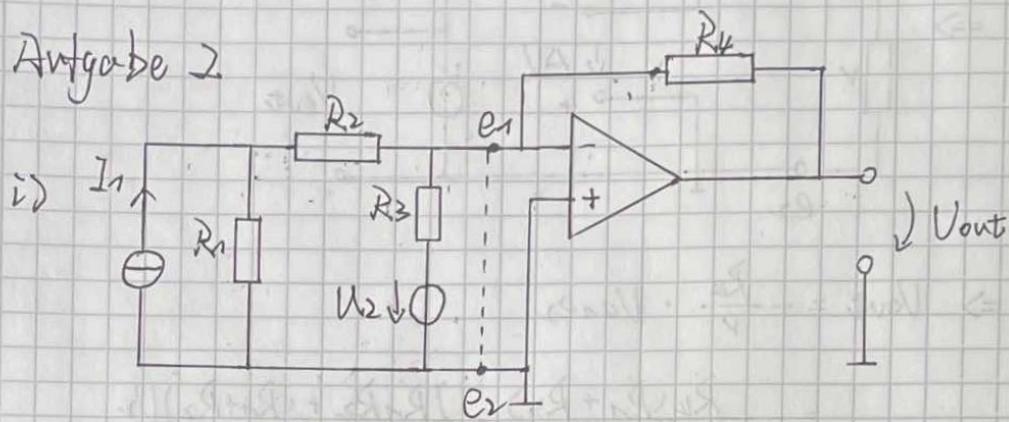


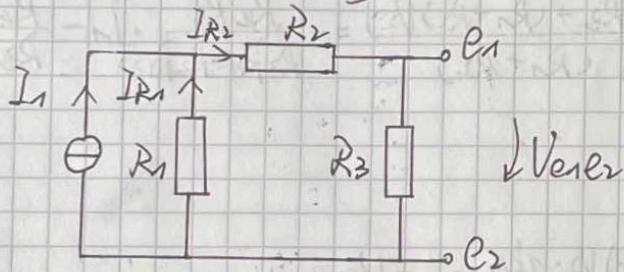
Abgabe 3

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Aufgabe 2



① Ersatzspannungsquelle:

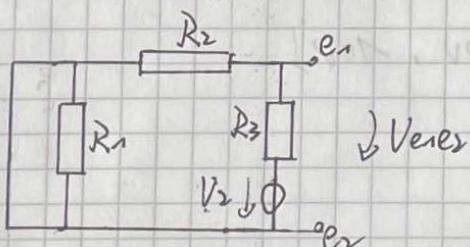


$$\left\{ \begin{array}{l} I_{R1} \cdot R_1 = I_{R2} \cdot R_2 + I_{R3} \cdot R_3 \\ I_1 = I_{R1} + I_{R2} \end{array} \right.$$

$$V_{ener} = R_3 \cdot I_{R2}$$

$$\Rightarrow \hat{V}_{ener} = \frac{I_1 \cdot R_1 \cdot R_3}{R_1 + R_2 + R_3}$$

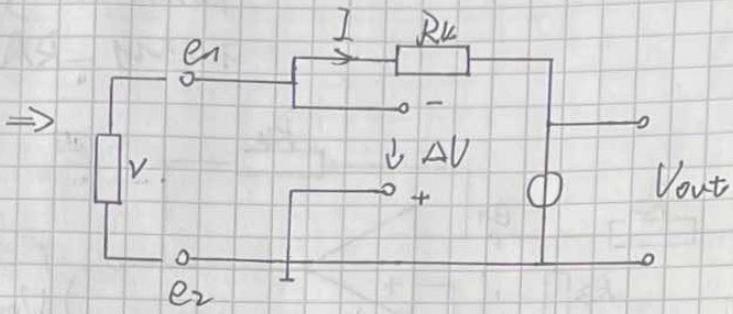
②



$$\Rightarrow \hat{V}_{ener} = -\frac{R_1 + R_2}{R_1 + R_2 + R_3} \cdot U_2$$

Also

$$V_{ener} = \hat{V} + \hat{V}_{ener} = \frac{I_1 (R_1 R_3 + (R_1 + R_2) \cdot U_2)}{R_1 + R_2 + R_3}$$



$$\begin{aligned}
 \Rightarrow V_{\text{out}} &= -\frac{R_L}{V} \cdot V_{e_1 e_2} \\
 &= -\frac{R_L(R_1 + R_2)}{(R_2 + R_1) \cdot R_3} \cdot \frac{[R_1 R_3 + (R_1 + R_2) V_2]}{R_1 + R_3} \\
 &= -\frac{R_L [R_1 R_3 + (R_1 + R_2) V_2]}{R_3 (R_1 + R_2)} = -\frac{R_L R_3}{R_3 R_1 + R_2 R_3} \cdot I_1 - \frac{R_L}{R_3} \cdot V_2
 \end{aligned}$$

ii)

$$V_{\text{out}} = -\frac{(1k\Omega + 1k\Omega) V_2 \cdot 1k\Omega}{1k\Omega (1k\Omega + 1k\Omega)} = -V_{\text{in}}$$

nicht in Sättigung

$$-V_S < V_{\text{out}} < V_S \text{ , mit } V_{\text{out}} = -V_{\text{in}}$$

$$\text{ALSO } V_{\text{in}} \in [-10V, 10V]$$