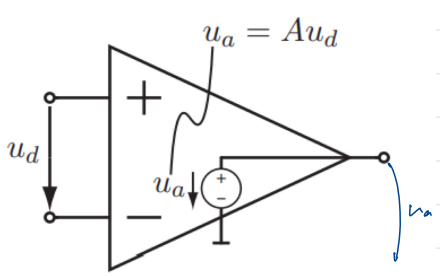
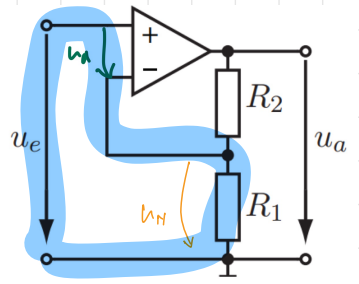
Beispiel - WR2

MLS 2

→ Aufgabe 1.1) Aus Theorie Slide 3 WR3.

1.2) a)



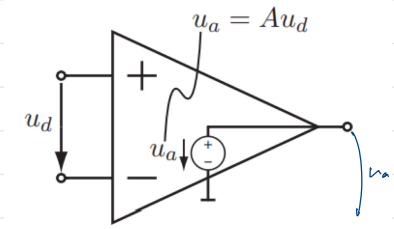


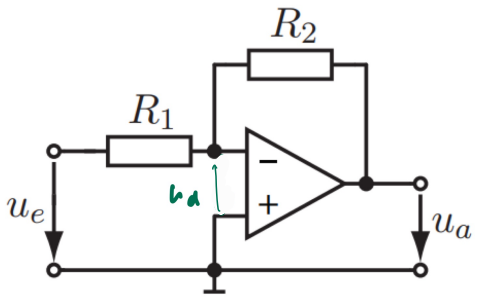
Nicht invertierend: $u_N = \frac{R_1}{R_1+R_2} u_a$ $\quad u_a = u_e - u_N = u_e - u_a \frac{R_1}{R_1+R_2}$

$A \cdot u_d = u_a \Longrightarrow u_a = A \cdot \left(u_e - u_a \frac{R_1}{R_1+R_2}\right) \rightarrow u_a \left(1 + \frac{A R_1}{R_1+R_2}\right) = A \cdot u_e$

$\Rightarrow u_a = \frac{A(R_1+R_2)}{R_1+R_2+R_1 A} \cdot u_e$

1.2) b)





Invertierend: $i_{R_1} = \frac{u_e + u_a}{R_1}$ und $i_{R_2} = \frac{-u_a - u_a}{R_2}$

$i_{R_1} = i_{R_2}$

$A \cdot u_d = u_a$, $u_d = \frac{u_a}{A}$

$\frac{u_e + u_a}{R_1} = \frac{-u_a - u_a}{R_2}$

$\frac{u_e + \frac{u_a}{A}}{R_1} = \frac{-u_a - \frac{u_a}{A}}{R_2}$

$\Rightarrow \frac{u_e}{R_1} = u_a \left(\frac{-1}{R_1 A} - \frac{1}{R_2} - \frac{1}{R_2 A}\right)$

$\Rightarrow u_a = \frac{1}{\frac{-1}{A} - \frac{R_1}{R_2} - \frac{R_1}{R_2 A}} \cdot u_e = \frac{R_2 A}{-R_2 - R_1 A - R_1} \cdot u_e$

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3)

Nicht inv. $\lim_{A \to \infty} \frac{A(R_1+R_2)}{R_1+R_2+R_1 A} u_e = \frac{R_1+R_2}{R_1} u_e = \left(1 + \frac{R_2}{R_1}\right) u_e$

Inv. $\lim_{A \to \infty} \frac{R_2 A}{-R_2 - R_1 A - R_1} \cdot u_e = \frac{-R_2}{R_1} u_e$