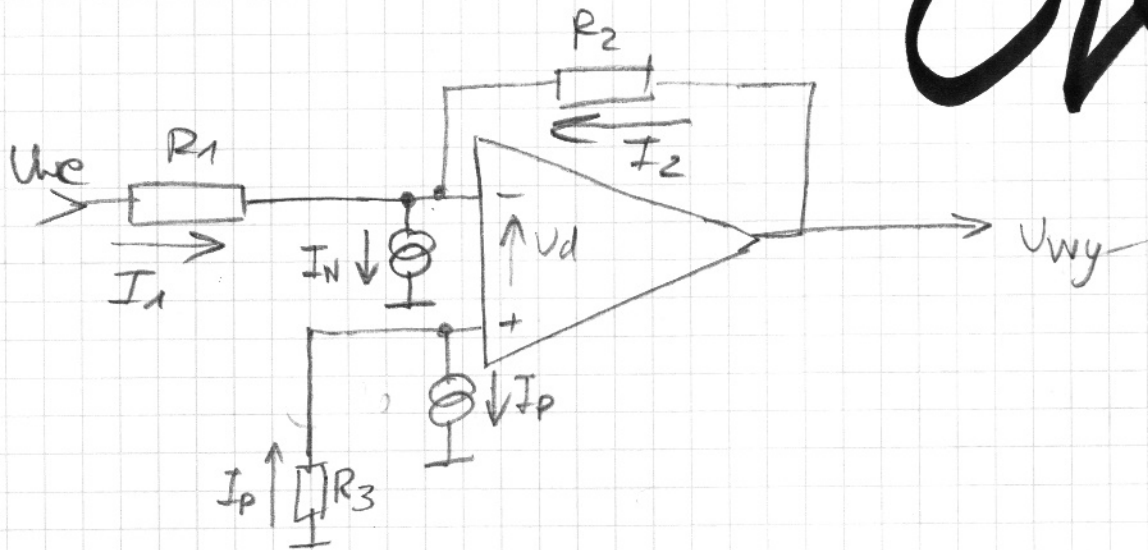


Wzm odwrócony

OK



$$I_1 + I_2 = I_N \rightarrow I_1 = I_N - I_2$$

Superpozycja

$$U_D = \frac{-U_{wy}}{A}$$

$$U_D = U_{wy} \frac{R_2}{R_1 + R_2} + U_{we} \frac{R_1}{R_1 + R_2} + I_N \frac{R_1 R_2}{R_1 + R_2} - I_p R_3$$

$$-\frac{U_{wy}}{A} - U_{wy} \frac{R_2}{R_1 + R_2} = U_{we} \frac{R_1}{R_1 + R_2} + I_N \frac{R_1 R_2}{R_1 + R_2} - I_p R_3$$

$$-U_{wy} \left( \frac{1}{A} + \frac{R_2}{R_1 + R_2} \right) = U_{we} \frac{R_1}{R_1 + R_2} + I_N \frac{R_1 R_2}{R_1 + R_2} - I_p R_3$$

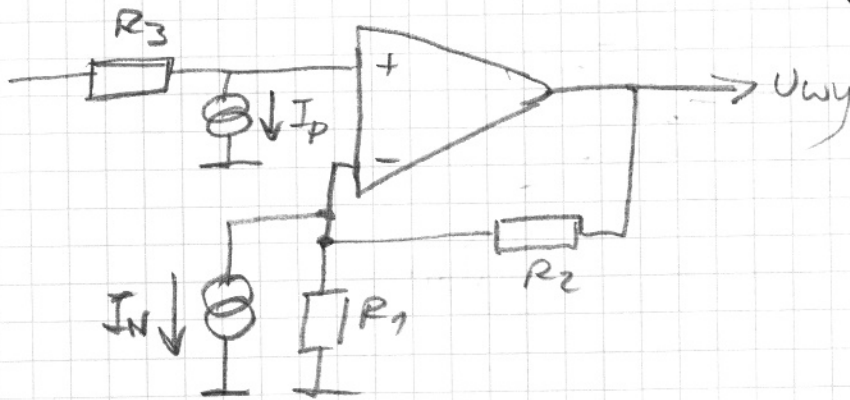
$$\begin{aligned} U_{wy} = 0 \\ U_{we} = 0 \end{aligned} \Rightarrow 0 = I_N \frac{R_1 R_2}{R_1 + R_2} - I_p R_3$$

$$I_N \approx I_p$$

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

Wzm wiadomości

OK



$$U_+ = U_{we} + I_p R_3$$

$$U_- = \frac{R_1}{R_1 + R_2} U_{wy} - I_N \frac{R_1 R_2}{R_1 + R_2}$$

$$U_{wy} = A(U_+ - U_-)$$

$$= A \left( U_{we} + I_p R_3 - \frac{R_1}{R_1 + R_2} U_{wy} - I_N \frac{R_1 R_2}{R_1 + R_2} \right)$$

$$\frac{U_{wy}}{A} = U_{we} + I_p R_3 - \frac{R_1}{R_1 + R_2} U_{wy} - I_N \frac{R_1 R_2}{R_1 + R_2}$$

$$U_{we} = 0$$

$$U_{wy} = 0$$

$$0 = I_p R_3 - I_N \frac{R_1 R_2}{R_1 + R_2}$$

$$I_p R_3 = I_N \frac{R_1 R_2}{R_1 + R_2}$$

$$I_p \approx I_N$$

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