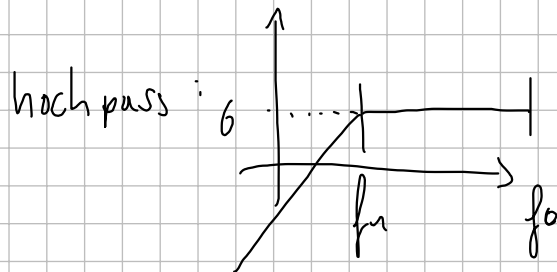
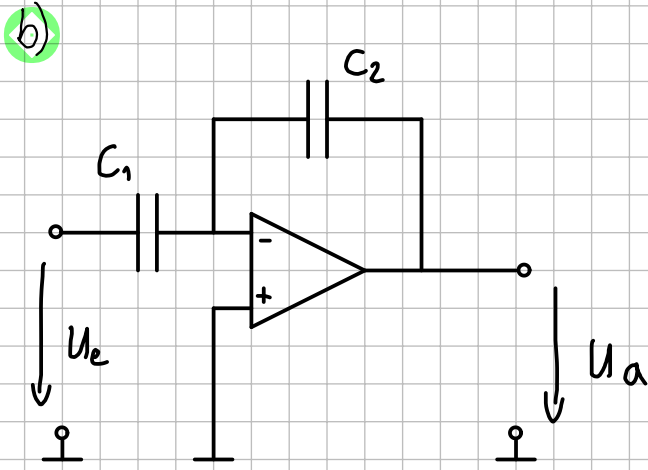


a)
$$\frac{U_a}{U_e} = - \frac{C_2 \parallel R}{C_1} =$$

$$= \frac{\frac{1}{j\omega C_2} \cdot R}{\frac{1}{j\omega C_2} + R} = - \frac{R}{1 + j\omega C_2 R} =$$

$$= - \frac{R j\omega C_1}{1 + j\omega C_2 R}$$



$$|G(\omega_u)| = 6$$

$$\omega_u = 2\pi f_u$$

$$G = - \frac{\frac{1}{j\omega C_2}}{\frac{1}{j\omega C_1}} \rightarrow - \frac{C_1}{C_2} \rightarrow \frac{C_1}{C_2} = 6 \rightarrow C_2 = \frac{C_1}{6} = \underline{7,83 \text{ nF}}$$

c) $G(f_{\text{stör}})_{\text{dB}} = -40 \text{ dB} \rightarrow G(f_{\text{stör}}) = - \frac{R j 2\pi f_{\text{st}} C_1}{1 + j 2\pi f_{\text{st}} C_2 R}$

$$G(f_{\text{stör}})_{\text{dB}} = 20 \log \left(\left| - \frac{R j 2\pi f_{\text{st}} C_1}{1 + j 2\pi f_{\text{st}} C_2 R} \right| \right) = 20 \log \left(\frac{2\pi f_{\text{st}} C_1 R}{\sqrt{1 + (2\pi f_{\text{st}} C_2 R)^2}} \right) = -40 \text{ dB}$$

$$\omega^{-2} \cdot \sqrt{1 + 4\pi^2 f_{\text{st}}^2 C_2^2 R^2} = 2\pi f_{\text{st}} C_1 R$$

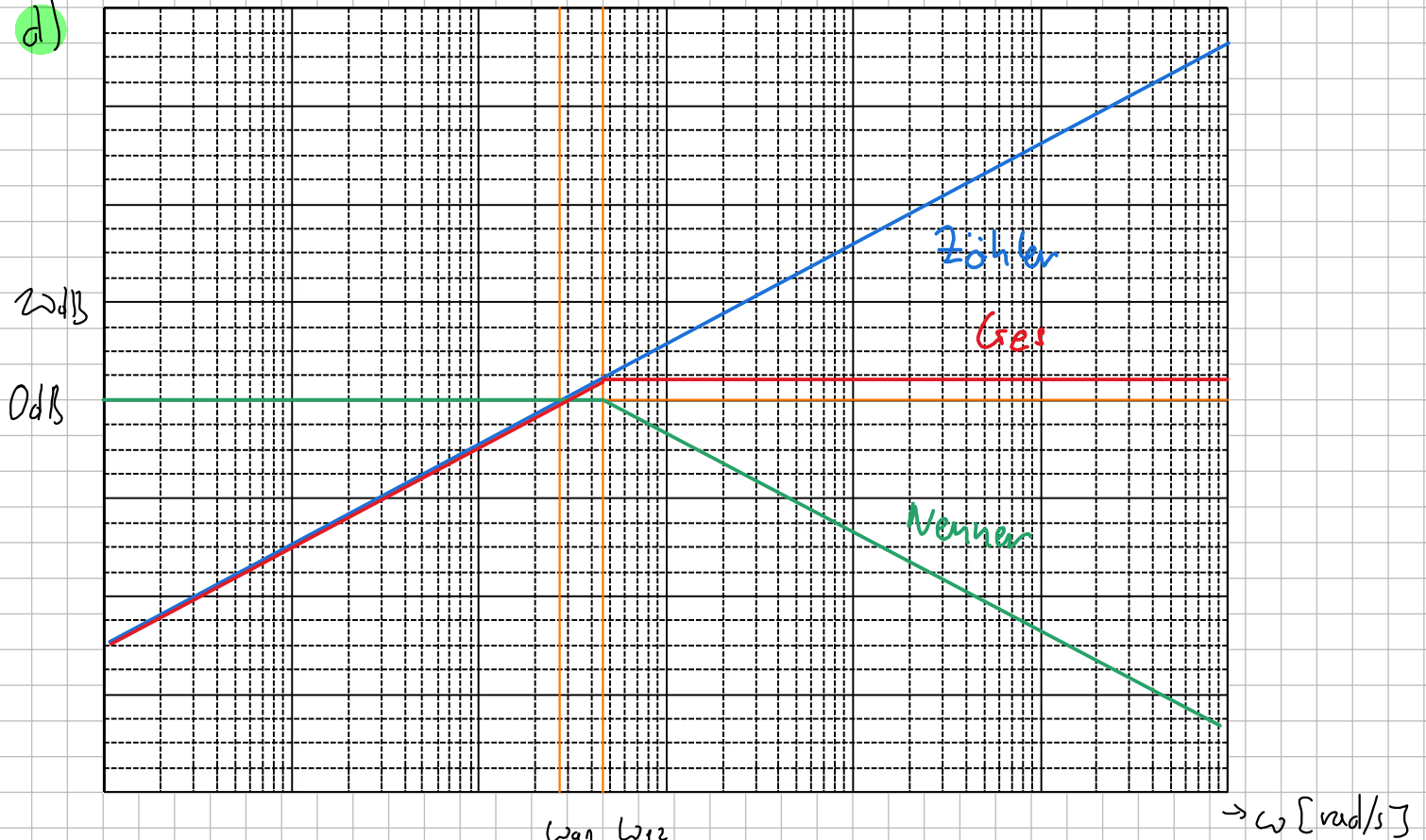
$$\omega^{-4} + \omega^{-4} 4\pi^2 f_{\text{st}}^2 C_2^2 R^2 = 4\pi^2 f_{\text{st}}^2 C_1^2 R^2$$

$$\frac{\omega^{-4}}{4\pi^2 f_{\text{st}}^2} + \omega^{-4} C_2^2 R^2 = C_1^2 R^2 \rightarrow R^2 (C_1^2 - \omega^{-4} C_2^2) = \frac{\omega^{-4}}{4\pi^2 f_{\text{st}}^2}$$

d) $Z_{\text{in}} = \frac{U_e}{I_e}$ Nutzbereich
 $\frac{1}{j\omega C_1}$ $\underline{33,86}$
 $f_o \text{ min } Z_{\text{in}}$

$$R = \frac{1}{200 \pi f_{st}} \cdot \frac{1}{\sqrt{C_1^2 - \omega^{-2} C_2^2}} = 338,63 \, \Omega$$

d)



$$G = \frac{R j \omega C_1}{1 + j \omega C_2 R} = \frac{j \omega \cdot \frac{1}{\omega_{g1}}}{1 + j \omega \frac{1}{\omega_{g2}}}$$

$$\omega_{g1} = \frac{1}{R C_1 2\pi} = 290,88 \, \text{kHz}$$

$$\omega_{g2} = \frac{1}{R C_2} = 423,28 \, \text{kHz}$$

e)

