II.3.5

$$\frac{U_2}{U_1} = \frac{1}{10} = \frac{R_e}{R_T + R_e} \Rightarrow \frac{R_T + R_e}{10} = R_e$$

$$R_T = 10 \cdot R_e - R_e$$

$$= 90 \cdot 10^6\,\Omega$$

a) $$\frac{U_2}{U_1} = \frac{R_e \| R_c}{R_T + (R_e \| R_c)} = \frac{R_e}{p \cdot C_e \cdot R_e \cdot R_T + R_e + R_T}$$

$$H(p) = \frac{R_e}{C_e \cdot R_e \cdot R_T} \cdot \frac{1}{p + \frac{R_c + R_T}{C_e \cdot R_e \cdot R_T}} \qquad p + \frac{R_c + R_T}{C_e \cdot R_e \cdot R_T} = 0$$

$$f_g = \frac{R_c + R_T}{2\pi C_e R_e \cdot R_T} = 824{,}19\,Hz$$

b) $$\frac{U_2}{U_1} = \frac{R_e \| C_e \cdot p}{R_T \| C_T p + R_e \| C_e \cdot p} = \frac{R_e \cdot C_T \cdot R_T \cdot (p + \frac{1}{R_T \cdot C_T})}{R_e \cdot R_T \cdot (C_e + C_T) \cdot (p + \frac{R_e + R_T}{R_e \cdot R_T (C_e + C_T)})}$$

$$\underline{\sigma_{01}} = p + \frac{1}{R_T \cdot C_T} = 0$$

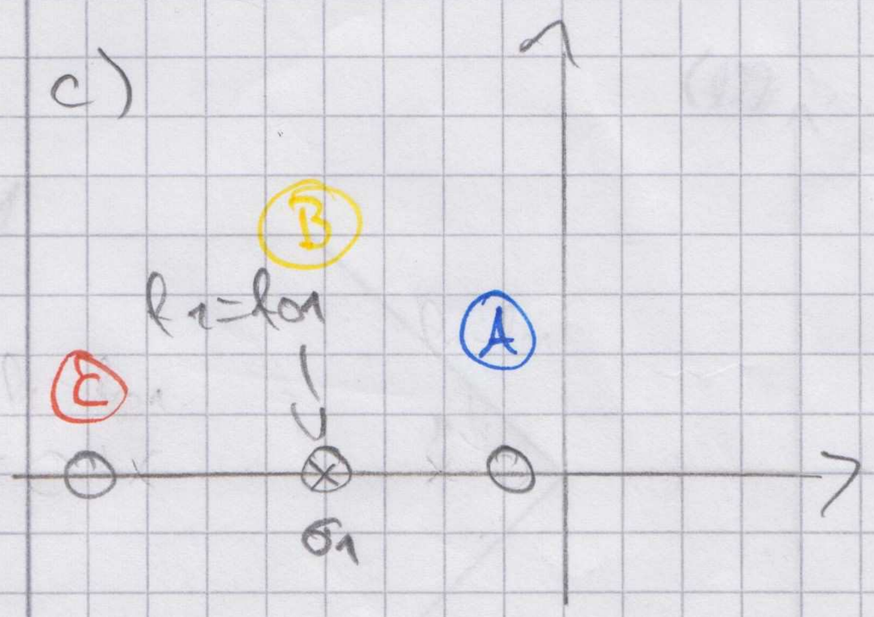
$$f_{01} = \frac{1}{2\pi R_T C_T}$$

$$\sigma_1 = p + \frac{R_e + R_T}{R_e R_T (C_e + C_T)} = 0$$

$$f_1 = \frac{R_e + R_T}{R_e R_T (C_e + C_T) \cdot 2\pi}$$

Pol nicht nach rechts
Null " " links

c)



(Diagramm auf Rückseite!)

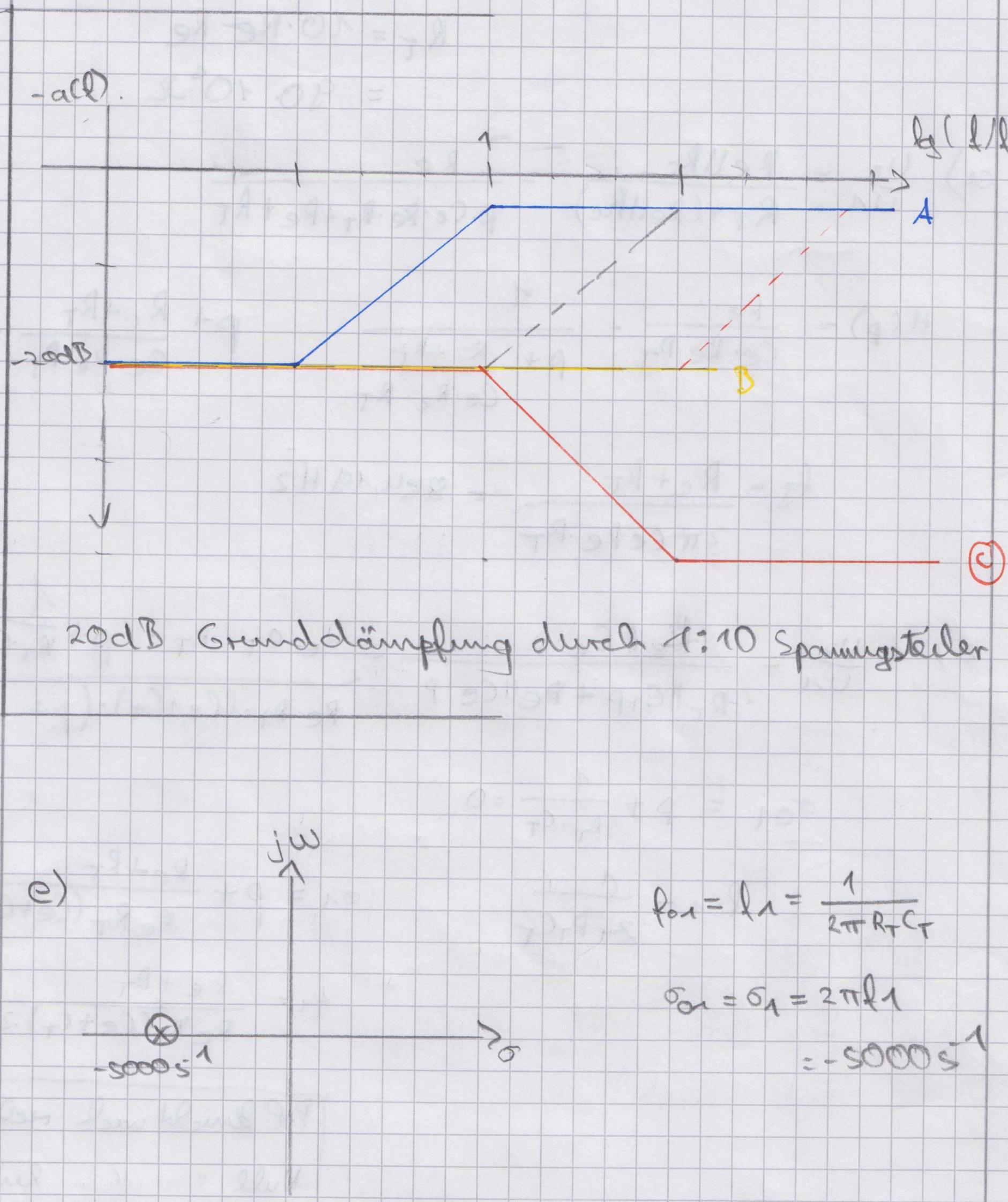
f) $f_{3dB} = \infty$

→ wenn f_{3dB} nicht vorhanden, dann immer ∞?

d) $\frac{1}{R_T \cdot C_T 2\pi} = \frac{R_e + R_T}{R_e \cdot R_T \cdot (C_e + C_T) 2\pi} \Rightarrow C_T = \frac{C_e \cdot R_e}{R_T}$

$= 2{,}222 \cdot 10^{-12}\,F$

zu c)



20dB Grunddämpfung durch 1:10 Spannungsteiler

e)

$f_{01} = f_1 = \frac{1}{2\pi R_T C_T}$

$\sigma_{01} = \sigma_1 = 2\pi f_1$

$= -5000\,s^{-1}$