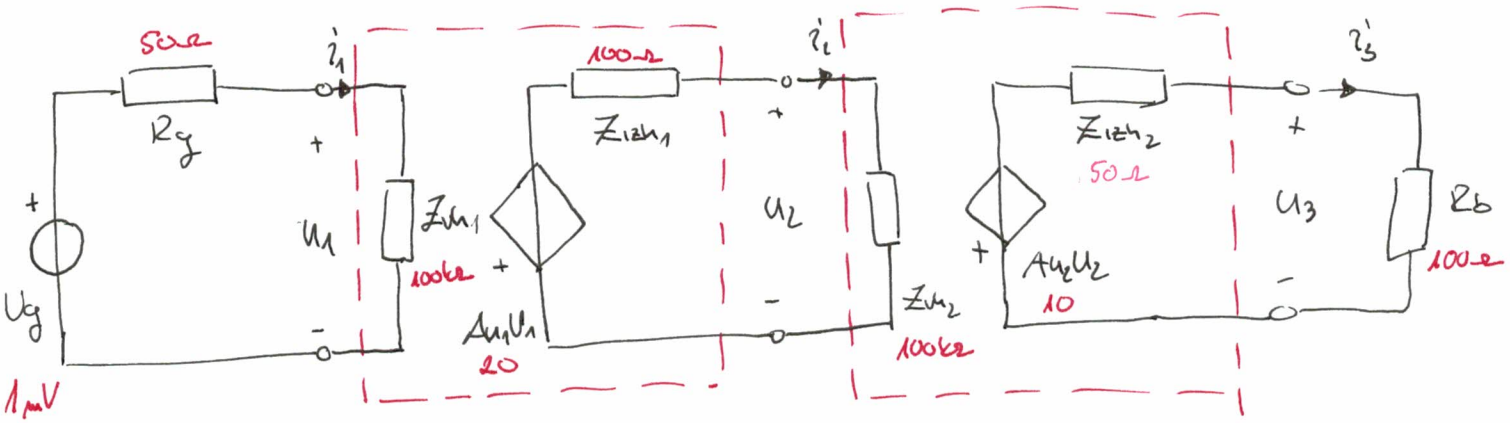


① $U_g - i_1 R_g - U_1 = 0$

$U_1 = i_1 \cdot Z_{vh_1}$

$i_1 = \frac{U_1}{Z_{vh_1}}$

$U_g - \frac{U_1 R_g}{Z_{vh_1}} - U_1 = 0$

$-U_1\left(\frac{R_g}{Z_{vh_1}} + 1\right) = -U_g$

$U_1 = \frac{U_g Z_{vh_1}}{R_g + Z_{vh_1}}$

② $A_{u_1}U_1 - Z_{izh_1} i_2 - U_2 = 0$

$i_2 = \frac{U_2}{Z_{vh_2}}$

$\frac{A_{u_1} U_g Z_{vh_1}}{R_g + Z_{vh_1}} - \frac{U_2 Z_{izh_2}}{Z_{vh_2}} - U_2 = 0$

$U_2\left(\frac{Z_{izh_2} + Z_{vh_2}}{Z_{vh_2}}\right) = \frac{A_{u_1} U_g Z_{vh_1}}{R_g + Z_{vh_1}}$

$U_2 = \frac{A_{u_1} U_g Z_{vh_1}}{R_g + Z_{vh_1}} \cdot \frac{Z_{vh_2}}{Z_{izh_2} + Z_{vh_2}}$

③ $A_{u_2}U_2 - i_2 Z_{izh_2} - U_3 = 0$

$U_3 = i_3 \cdot R_b \Rightarrow i_3 = \frac{U_3}{R_b}$

$A_{u_2}U_2 - \frac{U_3 Z_{izh_2}}{R_b} - U_3 = 0$

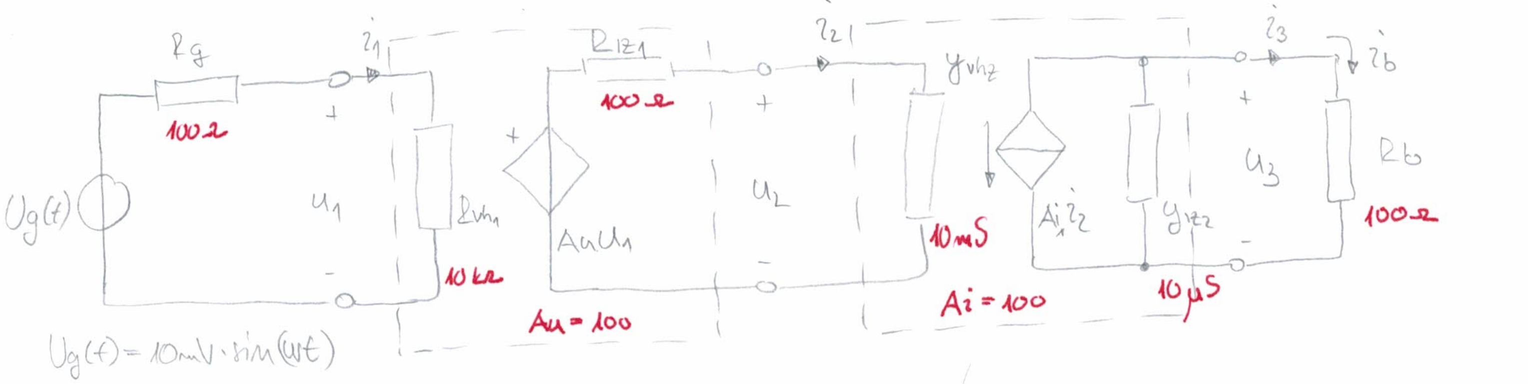
$U_3 = \frac{R_b A_{u_2} U_2}{Z_{izh_2} + R_b}$

$U_3 = \frac{R_b A_{u_2}}{Z_{izh_2} + R_b} \cdot \frac{A_{u_1} U_g Z_{vh_1}}{R_g + Z_{vh_1}} \cdot \frac{Z_{vh_2}}{Z_{izh_2} + Z_{vh_2}} \quad / \cdot U_g$

$A_{u_V} = \frac{U_3}{U_g}$

$\frac{U_3}{U_g} = A_{u_1} A_{u_2} \cdot \frac{R_b}{R_b + Z_{izh_2}} \cdot \frac{Z_{vh_1}}{Z_{vh_1} + R_g} \cdot \frac{Z_{vh_2}}{Z_{izh_2} + Z_{vh_2}}$

$= 20 \cdot 10 \cdot \frac{100\Omega}{100\Omega + 50\Omega} \cdot \frac{100k\Omega}{100k\Omega + 50\Omega} \cdot \frac{100k\Omega}{100k\Omega + 50\Omega} = \boxed{133{,}2}$



$U_g(t) = 10mV \cdot \sin(\omega t)$

$f = 10 kHz$

$A_p = A_i \cdot A_u$

$A_{iv} = \frac{i_3}{i_1}$

$A_{uv} = \frac{U_3}{U_g} = \frac{U_3}{U_2} \cdot \frac{U_2}{U_1} \cdot \frac{U_1}{U_g}$

$[Y] = \begin{bmatrix} 10mS & \emptyset \\ 100 & 10\mu S \end{bmatrix} \rightarrow [Z] = \begin{bmatrix} 100\Omega & \emptyset \\ 100k\Omega & -1\cdot 10^9\Omega \end{bmatrix}$

$\Delta Y = 0{,}1 \mu S^2$

$U_g - i_1 R_g - i_1 R_{vh1}$

$U_1 = i_1 R_{vh1}$

$U_1 = \frac{U_g R_{vh1}}{R_g + R_{vh1}}$

$A_u U_1 - i_2 R_{iz1} - i_2 Z_{vh2} = \emptyset$

$U_2 = i_2 \cdot Z_{vh2}$

$U_2 = \frac{A_u U_1 Z_{vh2}}{R_{iz1} + Z_{vh2}}$

i_2

$A_i i_2 \cdot Z_{vh2} - i_3 R_b = \emptyset$

$U_3 = i_3 R_b$

$U_3 = \frac{A_i i_2 \cdot Z_{vh2} R_b}{R_b}$

$U_3 = -A_i i_2 \cdot \frac{1}{y_{iz2}} \| R_b$

-9881

$U_3 = A_u \cdot U_g$

$= -9881 \cdot 10mV \cdot \sin \omega t$

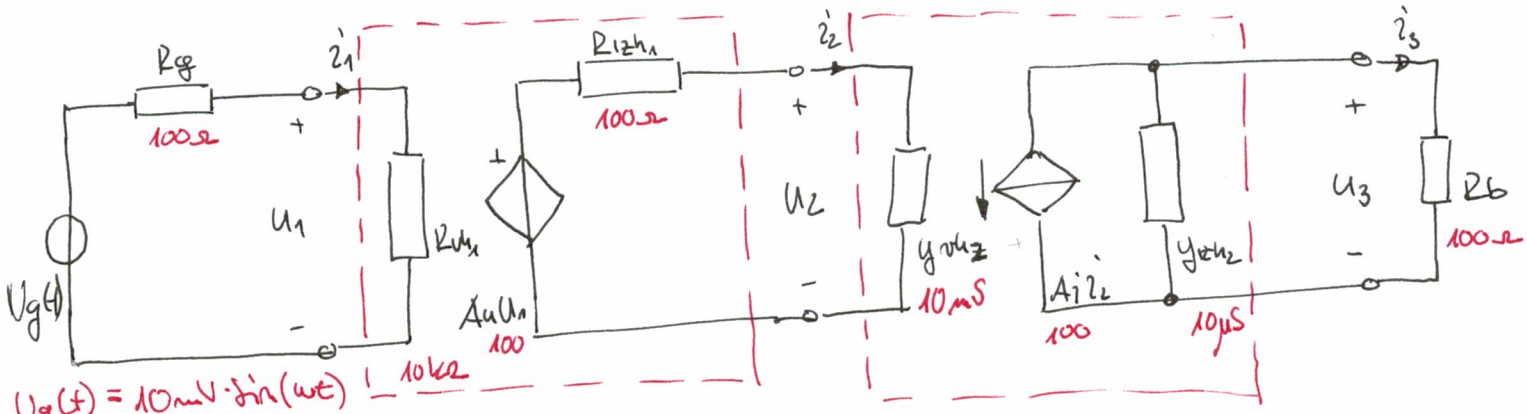
$= -98{,}81 \sin \omega t \, V$

$i_b = \frac{U_3}{R_b} = -0{,}9881 A \sin \omega t$

$P_{Rb} = U_3 \cdot i_b = 97{,}63 W \sin^2 \omega t$

za $|\sin| = 1$!

$P_{Rb} = U_{ef} \cdot I_{ef} = \frac{U_m}{\sqrt{2}} \cdot \frac{I_m}{\sqrt{2}} = \frac{U_m I_m}{2}$



$U_g(t) = 10mV \cdot \sin(\omega t)$

$f = 10kHz$

① $U_g - i_1 R_g - U_1 = 0$

$U_1 = i_1 R_{vh1}$

② $A_u U_1 - i_2 R_{izh1} - U_2 = 0$

$U_2 = i_2 \cdot \frac{1}{y_{vh2}}$

③ $U_3 = -A_i i_2 \cdot \frac{1}{y_{vh2}} \| R_b$

$U_g - \frac{R_g U_1}{R_{vh1}} - U_1 = 0$

$U_1 \left(\frac{R_g + R_{vh1}}{R_{vh1}} \right) = U_g$

$\boxed{U_1 = \frac{U_g R_{vh1}}{R_g + R_{vh1}}}$

$i_2 = \frac{A_u U_1}{R_{izh1} + \frac{1}{y_{vh2}}}$

$i_2 = \frac{A_u U_1 y_{vh2}}{R_{izh1} y_{vh2} + 1}$

$\boxed{i_2 = \frac{A_u y_{vh2}}{R_{izh1} y_{vh2} + 1} \cdot \frac{U_g R_{vh1}}{R_g + R_{vh1}}}$

$U_3 = -A_i A_u \cdot \frac{y_{vh2}}{R_{izh1} y_{vh2} + 1} \cdot \frac{U_g R_{vh1}}{R_g + R_{vh1}} \cdot \frac{\frac{1}{y_{vh2}} \cdot R_b}{\frac{1}{y_{vh2}} + R_b}$

$\frac{R_b}{y_{vh2}}$ / $\frac{1 + R_b y_{vh2}}{y_{vh2}}$

$A_{uv} = \frac{U_3}{U_g(t)}$

$\frac{U_3}{U_g} = -A_i A_u \cdot \frac{y_{vh2}}{R_{izh1} y_{vh2} + 1} \cdot \frac{R_{vh1}}{R_g + R_{vh1}} \cdot \frac{R_b}{R_b y_{vh2} + 1}$

$= -100 \cdot 100 \cdot \frac{10mS}{100\Omega \cdot 10mS + 1} \cdot \frac{10k\Omega}{100\Omega + 10k\Omega} \cdot \frac{100\Omega}{100\Omega \cdot 10\mu S + 1} = \boxed{-4945,55}$

$10000 \quad 2 \quad 10100 \quad 4,001$

$U_3 = A_u \cdot U_g$

$= \boxed{-49,46 \sin(\omega t)\,[V]}$

$i_b = \frac{U_3}{R_b} = \boxed{-0,495 \sin(\omega t)\,[A]}$

$P_{RB} = U_3 \cdot i_b = \boxed{24,46 \sin^2(\omega t)\,[W]}$