1) $\frac{u_{q1}}{R_1} + \frac{u_{q3}}{R_3} = u_{10}\left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}\right) - u_{20}\frac{1}{R_3}$

$-\frac{u_{q3}}{R_3} + \frac{u_{q4}}{R_4} = -u_{10}\frac{1}{R_3} + u_{20}\left(\frac{1}{R_3} + \frac{1}{R_4} + \frac{1}{R_5+R_6}\right)$

$I_1 = \frac{u_{q1}-u_{10}}{R_1}$ $I_2 = \frac{u_{10}}{R_2}$ $I_3 = \frac{u_{10}-u_{20}-u_{q3}}{R_3}$ $I_4 = \frac{u_{q4}-u_{20}}{R_4}$

$I_5 = \frac{u_{20}}{R_5+R_6}$

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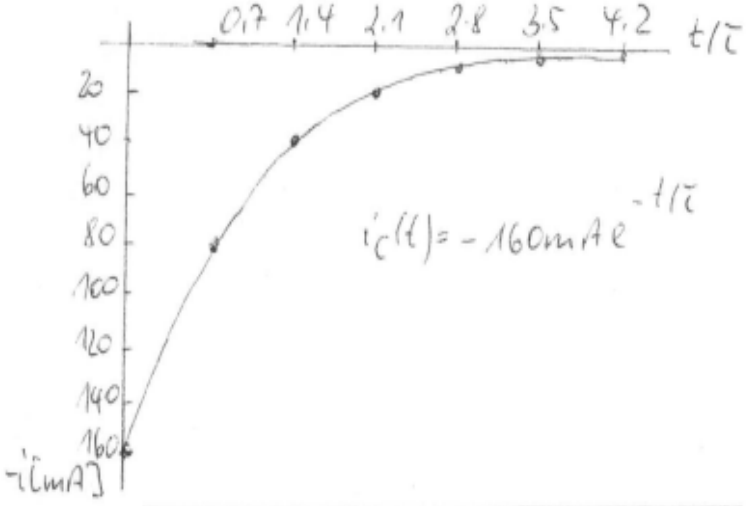
2) $t<0$ $t=0$ $t\to\infty$

$u_C = u_q$ $u_{R_2} = u_C = u_q = 24\,V$ $i_C = 0$

$i_C = -i_{R_2} = -\frac{u_q}{R_2} = -0{,}16\,A$ $u_{R_2} = u_C = \frac{u_q \cdot R_2}{R_1+R_2} = 14{,}4\,V$



$i_C(t) = -160\,mA\,e^{-t/\tau}$ $\tau = C(R_1 \| R_2) = 132\,\mu s$

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3) $B_K = \frac{B_5}{1-\delta} = 0{,}94\,T$ → Kennlinie $H_K = 2\,A/cm$

$\Theta = wI = \oint \vec{H}\,d\vec{l} = H_K l_{Fe} + H_\delta \cdot \delta = H_{Fe} l_K + \frac{B_5}{\mu_0}\cdot\delta$

$= 24\,A + 127{,}3\,A = 151{,}3\,A$

$I = \frac{\Theta}{w} = 1{,}51\,A$

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4) $\underline{\hat{I}} = 1{,}2\,A\,e^{-j60°}$

$\underline{\hat{I}}_R = \underline{\hat{I}} \cdot \frac{\frac{1}{j\omega C}}{R + \frac{1}{j\omega C}} = \frac{1{,}2\,A\,e^{-j60°} \cdot 7\,\Omega\,e^{-j90°}}{5\,\Omega - j7\,\Omega}$

$\underline{\hat{I}}_R = \frac{8{,}4\,V\,e^{-j150°}}{8{,}6\,\Omega\,e^{-j54{,}46°}} = 0{,}98\,A\,e^{-j95{,}54°}$

$i_R = 0{,}98\,A \sin(\omega t - 95{,}54°)$