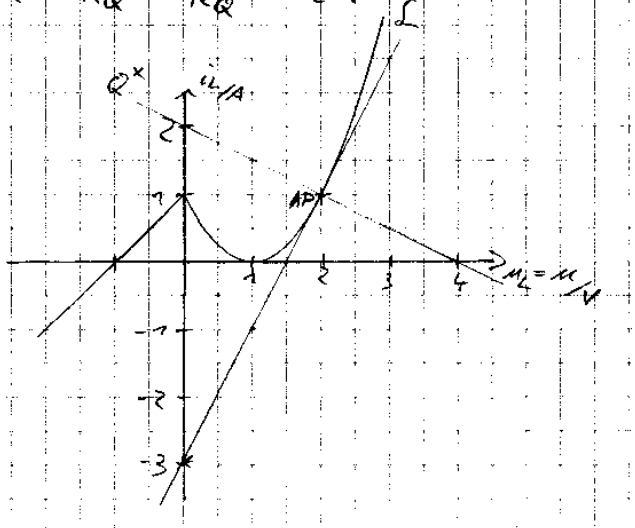
Aufgabe 5)

a) $u = R_Q i_Q + u_0$

$\Rightarrow i_Q = \frac{u}{R_Q} - \frac{u_0}{R_Q} = \frac{1}{2}\frac{A}{V} u - 2A$

b)



c) aktiv, verlustbehaftet, spannungsgesteuert

d) $i_Q = -i_L$

$-i_L = \frac{1}{2}\frac{A}{V} u - 2A$

$i_L = -\frac{1}{2}\frac{A}{V} u + 2A$

e) $-\frac{1}{2}\frac{A}{V} u + 2A = u^2 \frac{A}{V^2} - 2u\frac{A}{V} + 1A$

$u^2 \frac{A}{V^2} - 1{,}5\frac{A}{V} u - 1A = 0$

$u_{1/2} = \frac{1{,}5\frac{A}{V} \pm \sqrt{2{,}25\frac{A^2}{V^2} + 4\frac{A^2}{V^2}}}{2\frac{A}{V^2}} = \frac{1.5\frac{A}{V} \pm 2.5\frac{A}{V}}{2\frac{A}{V^2}}$

$u_1 = 2V \quad (u_2 = -0.5V)$

$-\frac{1}{2}\frac{A}{V} u + 2A = u\frac{A}{V} + 1 \quad \Rightarrow (u = \frac{2}{3} V)$

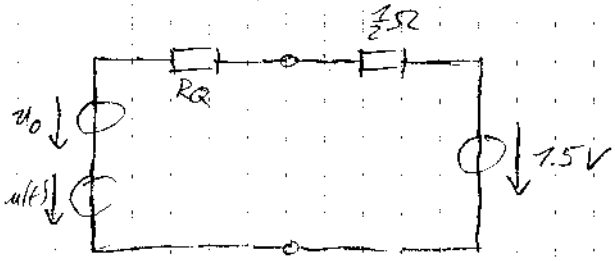
$\Rightarrow AP(2V, 1A)$

f) $i_{L,lin} = \left.\frac{di_L}{du_L}\right|_{AP} (u - u_{AP}) + i_{AP}$

$i_{L,lin} = \left(2u\frac{A}{V^2} - 2\frac{A}{V}\right)\Big|_{AP} (u - 2V) + 1A$

$i_{L,lin} = 2\frac{A}{V} u - 3A$

f) (Fortsetzung)



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