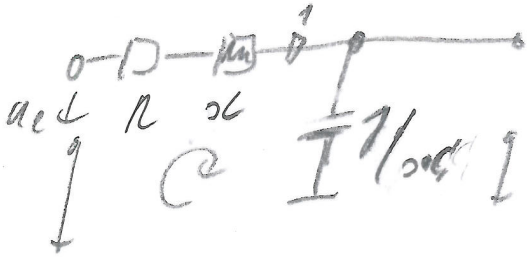

(13)

$u = L \cdot \frac{\delta i}{\delta t}$ $\quad u(\omega) = L \cdot \omega \cdot I(\omega)$

$\frac{u(\omega)}{I(\omega)} = L \cdot \omega$

$i = C \cdot \frac{\delta u}{\delta t} \circ\!-\!\bullet I(\omega) = C \cdot \omega \cdot U(\omega)$

$i = C \frac{\delta^2 u}{\delta t^2}$ $\quad \frac{U(\omega)}{I(\omega)} = \frac{1}{C \cdot \omega}$

$-u_e + i R + u_L + u_a = 0$

$-u_e + R C \frac{\delta u_a}{\delta t} + L \cdot C \frac{\delta^2 u_a}{\delta t^2} + u_a = 0$

$-U_e(\omega) + RC \cdot \omega \cdot U_a(\omega) + LC (\omega)^2 U_a(\omega) + U_a(\omega) = 0$

$\frac{U_a(\omega)}{U_e(\omega)} = \frac{1}{LC \omega^2 + RC \omega + 1}$

Pole

$LC \omega^2 + RC \omega + 1 = 0$

$\omega^2 + \frac{R}{L} \omega + \frac{1}{LC} = 0$

$-\frac{R}{2L} \pm \sqrt{\left(\frac{R}{2L}\right)^2 - \frac{1}{LC}}$

$= -\frac{R}{2L} \pm j \sqrt{\frac{1}{LC} - \left(\frac{R}{2L}\right)^2}$

$U_a(\omega) = U_e(\omega) \frac{1/j\omega C}{(R + j\omega L) + \frac{1}{j\omega C}}$

$= U_e \frac{1}{RC\omega + j\omega^2 LC + 1}$

$\Rightarrow \frac{U_a}{U_e} = \frac{1}{LC \omega^2 + RC \omega + 1}$

$$e^{at}\sin(bt) \circ\!\!-\!\!\bullet \frac{b}{(s-a)^2+b^2}$$

$$= \frac{b}{s^2-2as+a^2+b^2}$$

$$\frac{U_a(s)}{U_e(s)} = \frac{1}{LC_1 s^2 + RC_1 s + 1}$$

$$= \frac{1/LC_1}{s^2 + \frac{R}{L}s + \frac{1}{LC_1}}$$

$$\Rightarrow \quad -2a = \frac{R}{L} \Rightarrow a = -\frac{R}{2L}$$

$$a^2+b^2 = \frac{1}{LC_1}$$

$$\Rightarrow b^2 = \frac{1}{LC_1} - \left(\frac{R}{2L}\right)^2$$

$$\Rightarrow b = \sqrt{\frac{1}{LC_1} - \left(\frac{R}{2L}\right)^2}$$

$$\frac{U_a(s)}{U_e(s)} = \frac{1}{LC_1\sqrt{\frac{1}{LC_1} - \left(\frac{R}{2L}\right)^2}} \cdot \frac{\sqrt{\frac{1}{LC_1} - \left(\frac{R}{2L}\right)^2}}{\left(s+\frac{R}{2L}\right)^2 + \frac{1}{LC_1} - \left(\frac{R}{2L}\right)^2}$$

$\uparrow u_e(t) = 1$
Impuls!

$$= \frac{1}{\sqrt{LC_1 - \frac{R^2 \cdot L^2 \cdot C_1^2}{4L^2}}} \cdot \frac{\sqrt{\quad}}{(\quad)^2 + \frac{1}{LC_1} - \left(\frac{R}{2L}\right)^2}$$

$$\frac{u_a(s)}{u_e(s)} = \frac{1}{\sqrt{LC_1 - \frac{R^2 C_1^2}{4}}} \cdot \frac{\sqrt{\frac{1}{LC_1} - \left(\frac{R}{2L}\right)^2}}{\left(s + \frac{R}{2L}\right)^2 + \frac{1}{LC_1} - \left(\frac{R}{2L}\right)^2}$$

$$\boxed{\frac{1}{\frac{V_2 A_2}{A V} - \frac{V^2 A_2^2}{A^2 V^2} = 1}}$$

$u_e(s) = 1$ Impuls ?

$$\Rightarrow u_a(t) = \frac{1}{\sqrt{LC_1 - \frac{R^2 C_1^2}{4}}} \cdot e^{\left(-\frac{R}{2L}\right)t} \cdot \sin\left(\sqrt{\frac{1}{LC_1} - \left(\frac{R}{2L}\right)^2} \cdot t\right)$$