

$$I_1 + I_2 + I_3 = 0$$

$$\frac{V_2 - V_1}{sL} + \frac{V_2}{1/sC} + \frac{V_2}{R} = 0$$

$$\frac{V_2}{sL} - \frac{V_1}{sL} + sC V_2 + \frac{V_2}{R} = 0$$

$$V_2 \cdot \left(\frac{1}{sL} + sC + \frac{1}{R} \right) = \frac{V_1}{sL}$$

$$V_2 \cdot \left(\frac{s^2 \cdot CLR + sL + R}{RLs} \right) = \frac{V_1}{sL}$$

$$\frac{V_2}{V_1} = \frac{R}{s^2 \cdot CLR + sL + R} = \frac{R/CLR}{s^2 + s \cdot \frac{1}{CLR} + R/CLR} = \frac{1/CL}{s^2 + \frac{1}{CR}s + \frac{1}{CL}}$$

$$\frac{V_2}{V_1} = \frac{\omega_0^2}{s^2 + \frac{\omega_0}{Q}s + \omega_0^2}$$

$$\omega_0^2 = \frac{1}{CL}$$

$$\frac{\omega_0}{Q} = \frac{1}{RC} \rightarrow Q = RC \cdot \omega_0$$

$$Q = \sqrt{\frac{R}{L}} \cdot \frac{1}{\sqrt{CL}} = R \cdot \sqrt{\frac{C}{L}}$$

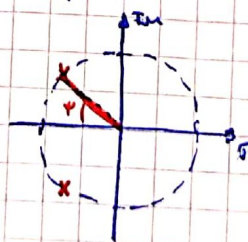
$$T(s) = \frac{1}{1 + \omega^2 \eta}$$

$$1/Q = 2\omega \eta$$

Butter

$$T(s) = \frac{1}{s^2 + 2\omega \eta s + 1}$$

$$\pi(s) = \frac{1}{s^2 + \sqrt{2} \cdot s + 1}$$



$$s_1 = \frac{\pi}{4}, s_2 = \frac{3\pi}{4}$$

$$\omega_N = 1$$

$$R' = 1$$

$$R_N = 1k \quad \Omega_N = 2\pi \cdot 1k$$

$$R = R_N \cdot R' = 1k \cdot 1$$

$$L = \frac{L' \cdot R_N}{\Omega_N} = \frac{1.42 \cdot 1k}{2\pi \cdot 1k} = 226 \text{ mH}$$

$$C = \frac{C'}{R_N \cdot \Omega_N} = \frac{0.707}{1k \cdot 2\pi \cdot 1k} = 112511 \text{ F}$$

Resonance

$$\frac{1}{Q} = \frac{1}{RC} \Rightarrow \frac{1}{Q} = \frac{1}{C}$$

$$Q = C' = 0.707$$

$$Q = 1 \cdot \sqrt{\frac{C}{L}} = \frac{1}{\sqrt{2}}$$

$$\frac{C}{L} = \frac{1}{2} \rightarrow C = 2 \cdot C'$$

$$L' = 1.42$$