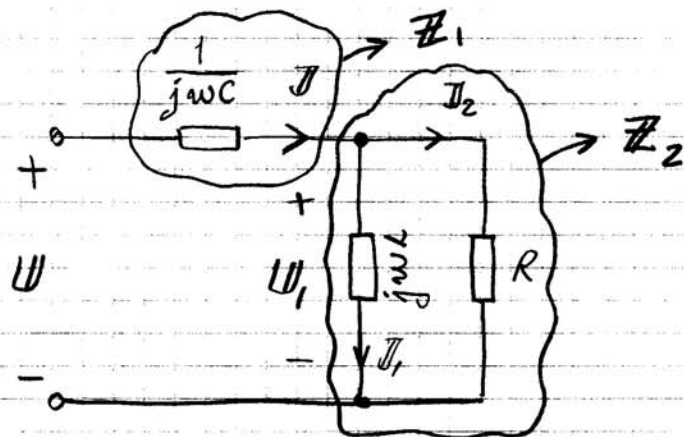


B1.6



$$C = 20 \mu\text{F}, \quad L = 0,05 \text{ H}, \quad R = 100 \Omega$$

$$u(t) = 10\sqrt{2} \sin(\underbrace{1000t + 0}_{\omega}) \text{ V}$$

$$\text{KOMPLEXA SPÄNNINGEN: } U = 10\sqrt{2} \cdot e^{j0} \text{ V}$$

$$Z_1 = \frac{1}{j\omega C} = -j50 \Omega$$

$$Z_2 = \frac{j\omega L \cdot R}{j\omega L + R} = \frac{j5000}{j50 + 100} =$$

$$= \frac{5000 \cdot e^{j90^\circ}}{\sqrt{100^2 + 50^2} \cdot e^{j \arctan \frac{50}{100}}} =$$

$$= 44,7 e^{j63,4^\circ} = 44,7 (\cos 63,4^\circ + j \sin 63,4^\circ) =$$

$$= (20 + j40) \Omega$$

$$\begin{aligned}
 Z_{TOT} &= Z_1 + Z_2 = 20 - j10 = \\
 &= \sqrt{20^2 + (-10)^2} \cdot e^{j \arctan \frac{-10}{20}} = \\
 &\approx 22,4 \cdot e^{-j26,6^\circ} \Omega
 \end{aligned}$$

$$\begin{aligned}
 I &= \frac{U}{Z_{TOT}} = \frac{10\sqrt{2} \cdot e^{j0}}{22,4 \cdot e^{-j26,6^\circ}} = \\
 &\approx 0,45\sqrt{2} \cdot e^{j26,6^\circ} \text{ A}
 \end{aligned}$$

$$\Rightarrow \underline{i(t) = 0,45\sqrt{2} \sin(1000t + 26,6^\circ) \text{ A}}$$

SPÄNNINGSDELNING \rightarrow

$$U_1 = U \cdot \frac{Z_2}{Z_1 + Z_2} \Rightarrow$$

$$U_1 = 10\sqrt{2} \cdot e^{j0} \cdot \frac{44,7 \cdot e^{j63,4^\circ}}{22,4 \cdot e^{-j26,6^\circ}} =$$

$$\approx 20\sqrt{2} \cdot e^{j90,0^\circ} \text{ V} \Rightarrow$$

$$\underline{u_1(t) = 20\sqrt{2} \sin(1000t + 90,0^\circ) \text{ V}}$$

$$\bar{I}_1 = \frac{U_1}{j\omega L} \Rightarrow \bar{I}_1 = \frac{20\sqrt{2} \cdot e^{j90,0^\circ}}{j50} =$$

$$= 0,4\sqrt{2} \cdot e^{j0^\circ} \text{ A}$$

$$\Rightarrow \underline{i}_1(t) = 0,4\sqrt{2} \sin(1000t + 0) \text{ A}$$

$$\bar{I}_2 = \frac{U_1}{R} \Rightarrow \bar{I}_2 = \frac{20\sqrt{2} \cdot e^{j90,0^\circ}}{100} =$$

$$= 0,2\sqrt{2} e^{j90,0^\circ} \text{ A}$$

$$\Rightarrow \underline{i}_2(t) = 0,2\sqrt{2} \sin(1000t + 90,0^\circ) \text{ A}$$

VISARDIAGRAM (I EFFEKTIVVÄRDESSKALA)

0,1 A RESP. 5V MOTSVARAR 1 CM.

