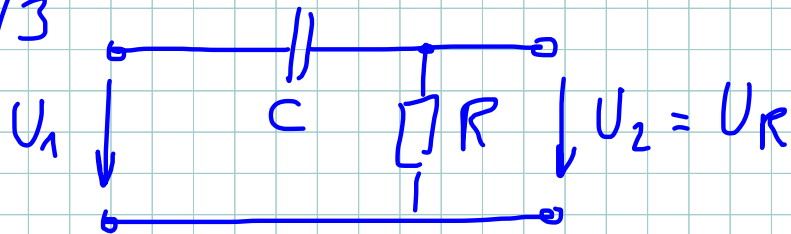
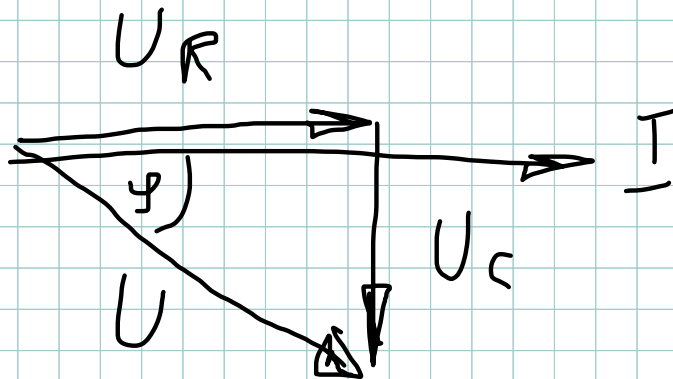


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$$U_1 = 230V$$

$$U_C = 155V$$



$$U_R = \sqrt{U^2 - U_C^2} = \sqrt{230^2 - 155^2} = 170V$$

$$\cos \varphi = \frac{U_R}{U} = \frac{170}{230} = 0,739$$

$$\Rightarrow \varphi = 42,4^\circ$$

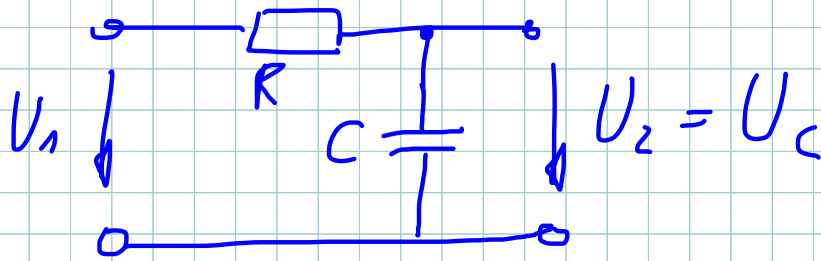
$$20V \hat{=} 1cm$$

$$U = 230V \rightarrow 11,5cm$$

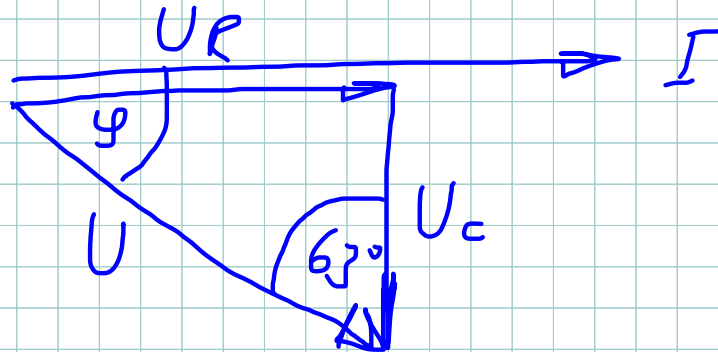
$$U_C = 155V \rightarrow 7,75cm$$

$$U_R = 170V \rightarrow 8,5cm$$

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$$U_R = 86 \text{ V} \quad R = 1 \text{ k}\Omega$$



$$\varphi = 90^\circ - 63^\circ = 27^\circ$$

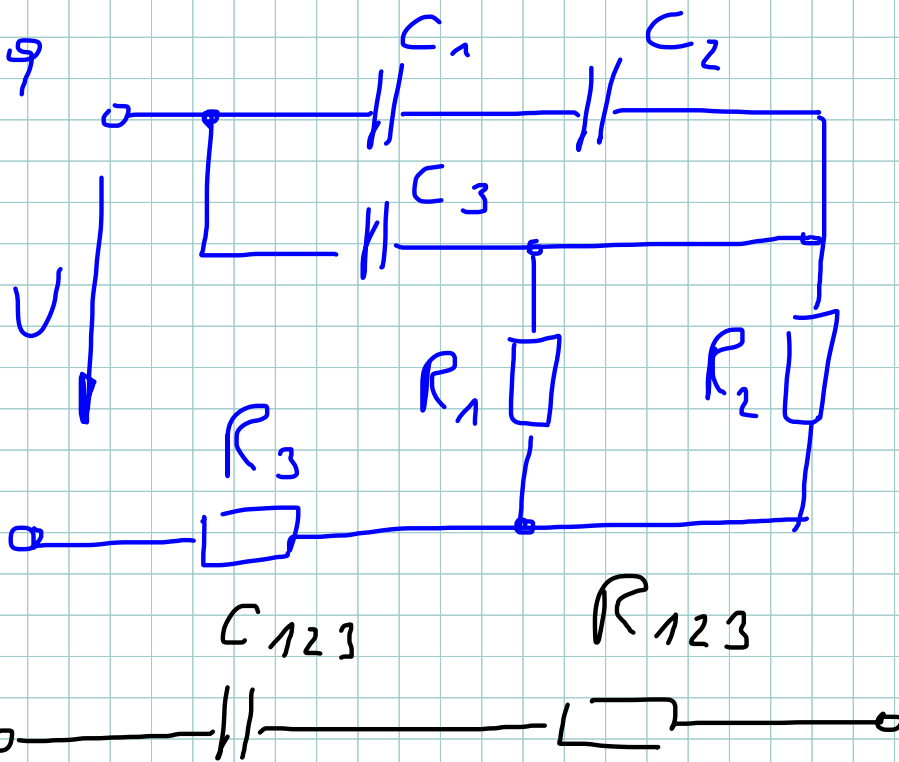
$$\cos \varphi = \frac{U_R}{U}$$

$$U = \frac{U_R}{\cos \varphi} = \frac{86}{\cos 27^\circ} = 96,5 \text{ V}$$

$$U_C = \sqrt{U^2 - U_R^2} = \sqrt{96,5^2 - 86^2} = 43,8 \text{ V}$$

$$10 \text{ V} \stackrel{\wedge}{=} 1 \text{ cm}$$

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$$C_{12} = \frac{C_1 \cdot C_2}{C_1 + C_2} = \frac{11\mu \cdot 9\mu}{11\mu + 9\mu} = 4,95\mu F$$

$$C_{123} = C_{12} + C_3 = 4,95\mu + 50n = 5\mu F$$

$$R_{12} = \frac{R_1 \cdot R_2}{R_1 + R_2} = \frac{700 \cdot 150}{700 + 150} = 123,5\Omega$$

$$R_{123} = R_{12} + R_3 = 123,5 + 55 = 178,5\Omega$$

$$X_{C123} = \frac{1}{2\pi f C_{123}} = \frac{1}{2 \cdot \pi \cdot 2000 \cdot 5 \mu\text{F}}$$
$$= 159,2 \Omega$$

$$Z = \sqrt{R_{123}^2 + X_{C123}^2} = \sqrt{178,5^2 + 159,2^2}$$
$$= 239,2 \Omega$$

$$I = \frac{U}{Z} = \frac{18}{239,2} = 75,2 \text{ mA}$$

$$\cos \varphi = \frac{R}{Z} = \frac{178,5}{239,2} = 0,746$$
$$\Rightarrow \varphi = 41,7^\circ$$

$$U_{R3} = I \cdot R_3 = 75,2 \text{ mA} \cdot 55 = 4,14 \text{ V}$$

$$U_{R12} = I \cdot R_{12} = 75,2 \text{ mA} \cdot 123,5 = 9,29 \text{ V}$$

$$U_{R1} = U_{R2} = U_{R12}$$

$$U_{C123} = X_{C123} \cdot I = 159,2 \cdot 75,2 \text{ m} = 11,97 \text{ V}$$

$$X_{C1} = \frac{1}{2 \cdot \pi \cdot f \cdot C_1} = \frac{1}{2 \cdot \pi \cdot 200 \cdot 11 \mu} = 72,3 \Omega$$

$$X_{C2} = \frac{1}{2 \pi f C_2} = \frac{1}{2 \cdot \pi \cdot 200 \cdot 9 \mu} = 88,4 \Omega$$

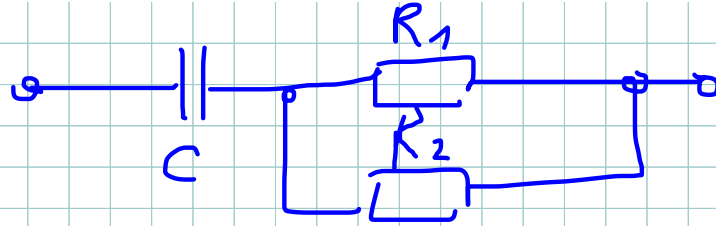
$$X_{C12} = X_{C1} + X_{C2} = 72,3 + 88,4 = 160,7 \Omega$$

$$I_{C12} = \frac{U_{C123}}{X_{C12}} = \frac{11,97}{160,7} = 74,4 \text{ mA}$$

$$U_{C1} = X_{C1} \cdot I_1 = 72,3 \cdot 74,4 \text{ m} = 5,3 \text{ V}$$

$$U_{C2} = X_{C2} \cdot I_2 = 88,4 \cdot 74,4 \text{ m} = 6,6 \text{ V}$$

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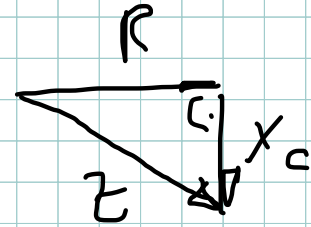
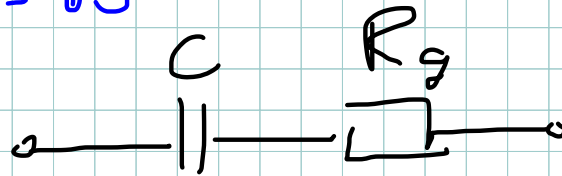
$$U = 230V$$

$$C = 2,2 \mu F$$

$$R_1 = 150 \Omega$$

$$R_2 = 250 \Omega$$

$$\varphi = 65^\circ$$



$$R_{12} = \frac{R_1 \cdot R_2}{R_1 + R_2} = \frac{150 \cdot 250}{150 + 250} = 93,8 \Omega$$

$$\cos \varphi = \frac{R}{Z}$$

$$Z = \frac{R}{\cos \varphi} = \frac{93,8}{\cos 65} = 221,9 \Omega$$

$$X_c = \sqrt{Z^2 - R^2} = \sqrt{221,9^2 - 93,8^2} = 201 \Omega$$

$$X_c = \frac{1}{2\pi f C}$$

$$f = \frac{1}{2\pi X_c \cdot C} = \frac{1}{2 \cdot \pi \cdot 201 \cdot 2,2 \mu} = 360 \text{ Hz}$$

$$I = \frac{U}{Z} = \frac{230}{221,8} = 1,04 \text{ A}$$

$$U_C = I \cdot X_C = 1,04 \cdot 201 = 209,4 \text{ V}$$

$$U_{R12} = I \cdot R_{12} = 1,04 \cdot 93,8 = 96,6 \text{ V}$$

$$I_{R1} = \frac{U_{R12}}{R_1} = \frac{96,6}{150} = 644 \text{ mA}$$

$$I_{R2} = \frac{U_{R12}}{R_2} = \frac{96,6}{250} = 386 \text{ mA}$$