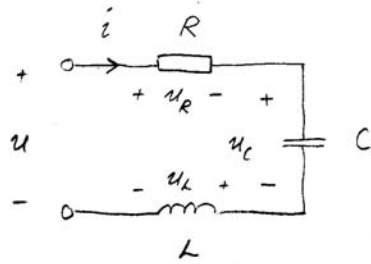


8.3

$f = 50 \text{ Hz}$



$$I = 2 \text{ A}$$

$$U_R = 100 \text{ V}$$

$$U_C = 200 \text{ V}$$

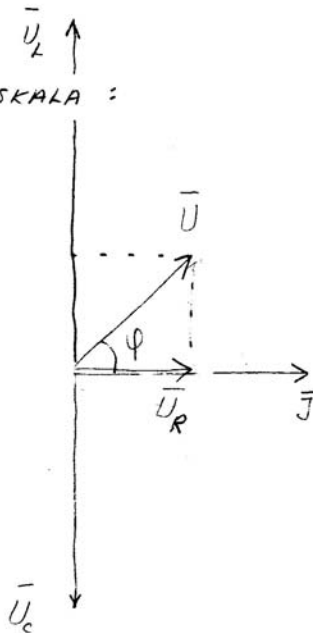
$$U_L = 300 \text{ V}$$

- * \bar{U} "ÄR" VEKTORSUMMAN AV \bar{U}_L , \bar{U}_C OCH \bar{U}_R .
- * \bar{U}_R LIGGER 1 FAS MED \bar{I} .
- * \bar{U}_C LIGGER 90° EFTER \bar{I} .
- * \bar{U}_L LIGGER 90° FÖRE \bar{I} .

LÄT 1A MOTSVARA 2CM

OCH 100V — 2CM

EFFEKTIVVÄRDESKALA :



$$U = 141 \text{ V} \quad (100\sqrt{2})$$

$$\varphi = 45^\circ$$

81.3

ALTERNATIV LÖSNING : RÄKNA KOMPLEXT (j ω -METODEN)

$$i(t) = 2\sqrt{2} \sin(\omega t + 0) [A] \rightarrow \underline{I} = 2\sqrt{2} e^{j0} [A]$$

$$u_R(t) = 100\sqrt{2} \sin(\omega t + 0) [V] \Rightarrow \underline{U}_R = 100\sqrt{2} e^{j0} [V]$$

$$u_C(t) = 200\sqrt{2} \sin(\omega t - \frac{\pi}{2}) [V] \Rightarrow \underline{U}_C = 200\sqrt{2} e^{-j\frac{\pi}{2}} [V]$$

$$u_L(t) = 300\sqrt{2} \sin(\omega t + \frac{\pi}{2}) [V] \Rightarrow \underline{U}_L = 300\sqrt{2} e^{+j\frac{\pi}{2}} [V]$$

$$\underline{U} = \underline{U}_L + \underline{U}_C + \underline{U}_R = 300\sqrt{2} \cdot \underbrace{e^{+j\frac{\pi}{2}}}_{+j} +$$

$$+ 200\sqrt{2} \underbrace{e^{-j\frac{\pi}{2}}}_{-j} + 100\sqrt{2} \underbrace{e^{j0}}_{=1} =$$

$$= j300\sqrt{2} - j200\sqrt{2} + 100\sqrt{2} =$$

$$= 100\sqrt{2} + j100\sqrt{2} = 100\sqrt{2} (1+j) = 200 e^{j45^\circ} [V]$$

$$\hat{U} = |\underline{U}| = 200 [V]$$

$$\text{EFFEKTIVVÄRDET } U = \frac{\hat{U}}{\sqrt{2}} \Rightarrow U = 141V$$

$$\psi = \arg \underline{U} - \arg \underline{I} = 45^\circ - 0 = 45^\circ$$