

1.4 a)

$$I_1 = \frac{U_1}{R_1} \quad I_1 = \frac{230 e^{j0^\circ}}{25} \text{ A} = 9,2 \cdot e^{j0^\circ} \text{ A}$$

$$I_2 = \frac{U_2}{R_2} \quad I_2 = \frac{230 \cdot e^{-j120^\circ}}{10} \text{ A} = 23 \cdot e^{-j120^\circ} \text{ A}$$

$$I_3 = \frac{U_3}{R_3} \quad I_3 = \frac{230 \cdot e^{-j240^\circ}}{50} \text{ A} = 4,6 \cdot e^{-j240^\circ} \text{ A}$$

$$I_1 = 9,2 (\cos 0^\circ + j \sin 0^\circ) = 9,2 \text{ A}$$

$$I_2 = 23 \cdot (\cos(-120^\circ) + j \sin(-120^\circ)) = (-11,5 - j 19,9) \text{ A}$$

$$I_3 = 4,6 (\cos(-240^\circ) + j \sin(-240^\circ)) = (-2,3 + j 4,0) \text{ A}$$

$$I_0 = I_1 + I_2 + I_3 \Rightarrow I_0 = (-4,6 - j 15,9) \text{ A}$$

$$I_0 = \sqrt{(-4,6)^2 + (-15,9)^2} \cdot e^{j \arctan \frac{-15,9}{-4,6}}$$

$$I_0 = 16,6 \cdot e^{-j106^\circ} \text{ A}$$

$$\uparrow$$

$$\underline{\underline{|I_0| = 16,6 \text{ A}}}$$

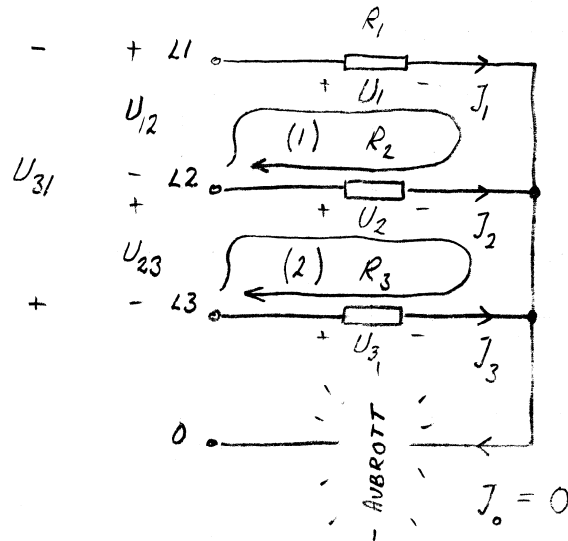
$$i_0(t) = \underbrace{16,6 \sqrt{2}}_{\hat{I}_0} \sin(\omega t - 106^\circ) \text{ A}$$

$\omega = 2\pi f$

ALTERNATIF: RITA USAR DIASEKAM

VAD HÄNDER MED U_1, U_2, U_3 OCH J_1, J_2, J_3 OM NOLL-

1.46



LEDAREN KLIPPS AV ?

$$R_1 = 25 \Omega$$

$$R_2 = 10 \Omega$$

$$R_3 = 50 \Omega$$

$$+ U_{12} - R_1 J_1 + R_2 J_2 = 0 \dots (1)$$

$$+ U_{23} - R_2 J_2 + R_3 J_3 = 0 \dots (2)$$

$$+ J_1 + J_2 + J_3 - J_0 = 0 \dots (3)$$

$$U_{12} = 230\sqrt{3} \cdot e^{+j30^\circ} \text{ V} = (345 + j199) \text{ V}$$

$$U_{23} = 230\sqrt{3} \cdot e^{-j90^\circ} \text{ V} = -j398 \text{ V}$$

$$U_{31} = 230\sqrt{3} \cdot e^{-j210^\circ} \text{ V} = (-345 + j199) \text{ V}$$

U_H

$$+ 345 + j199 - 25J_1 + 10J_2 = 0 \dots (1)$$

$$-j398 - 10J_2 + 50J_3 = 0 \dots (2)$$

$$J_1 + J_2 + J_3 + 0 = 0 \dots (3)$$

1,46 roots.

$$\begin{pmatrix} -25 & 10 & 0 & -345 - j199 \\ 0 & -10 & 50 & j398 \\ 1 & 1 & 1 & 0 \end{pmatrix} \sim \left\{ 25 \times (3) + (1) \right\} \sim$$

(J_1 J_2 J_3)

$$\sim \begin{pmatrix} -25 & 10 & 0 & -345 - j199 \\ 0 & -10 & 50 & j398 \\ 0 & 35 & 25 & -345 - j199 \end{pmatrix} \sim \left\{ (3) + 3,5 \times (2) \right\} \sim$$

$$\sim \begin{pmatrix} -25 & 10 & 0 & -345 - j199 \\ 0 & -10 & 50 & j398 \\ 0 & 0 & 200 & -345 + j1195 \end{pmatrix}$$

$$(3) \Rightarrow 200 J_3 = -345 + j1195$$

$$\Rightarrow J_3 = -1,73 - j5,98 \Rightarrow \underline{|J_3| = 6,2 \text{ A}} \Rightarrow \underline{|U_3| = 311 \text{ V}}$$

$$(2) \Rightarrow -10J_2 + 50(-1,73 + j5,98) = j398 \Rightarrow$$

$$\Rightarrow J_2 = -8,65 - j9,9 \Rightarrow \underline{|J_2| = 13,1 \text{ A}} \Rightarrow \underline{|U_2| = 131 \text{ V}}$$

$$(1) \Rightarrow -25J_1 + 10(-8,65 - j9,9) = -345 - j199 \Rightarrow$$

$$\Rightarrow J_1 = 10,34 + j4 \Rightarrow \underline{|J_1| = 11,1 \text{ A}} \Rightarrow \underline{|U_1| = 277 \text{ V}}$$