



$$R_1 = R_2 = R = 1 \text{ k}\Omega$$

$$u_1(t) = 30\sqrt{2} \sin(\omega t + 0) \text{ V}$$

$$u_2(t) = 60 \sin(\omega t + 45^\circ) \text{ V}$$

TRANSFORMATION TILL KOMPLEXA  
SPÄNNINGAR  $\Rightarrow$

$$U_1 = 30\sqrt{2} \cdot e^{j0} \text{ V}, \quad U_2 = 60 \cdot e^{j45^\circ} \text{ V} = (30\sqrt{2} + j30\sqrt{2}) \text{ V}$$

NODALANALYS  $\left\{ \begin{array}{l} J_2 = J_1 + J \Rightarrow J_2 - J_1 - J = 0 \Rightarrow \\ \frac{U_2 - V}{R_2} - \frac{V - (-U_1)}{R_1} - \frac{V - V_{\text{JORD}}}{R} = 0 \end{array} \right.$

$$\frac{(30\sqrt{2} + j30\sqrt{2}) - V}{1000} - \frac{V + 30\sqrt{2}}{1000} - \frac{V - 0}{1000} = 0$$

$$\Rightarrow V = j10\sqrt{2} = 10\sqrt{2} e^{j90^\circ} \text{ V}$$

$$J = \frac{V - V_{\text{JORD}}}{R} = 0,01\sqrt{2} e^{j90^\circ} \text{ A} \Rightarrow i(t) = 0,01\sqrt{2} \sin(\omega t + 90^\circ) \text{ A}$$

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Alternativ  
lösningSUPERPOSITIONSSATSEN OCH  
SPÄNNINGSDELNING GER:BIDRAGET FRÅN  $U_1$  BLIR  $U' = -\frac{1}{3} U_1$ BIDRAGET FRÅN  $U_2$  BLIR  $U'' = \frac{1}{3} \cdot U_2$ 

$$U = U' + U'' = 10\sqrt{2} \cdot e^{j180^\circ} + 20 \cdot e^{j45^\circ} =$$
$$= 10\sqrt{2} e^{j90^\circ} \text{ VOLT}$$

$$I = \frac{U}{R} \Rightarrow I = 10\sqrt{2} \cdot e^{j90^\circ} \text{ mA}$$

$$\Rightarrow i(t) = 10\sqrt{2} \sin(\omega t + 90^\circ) \text{ mA}$$