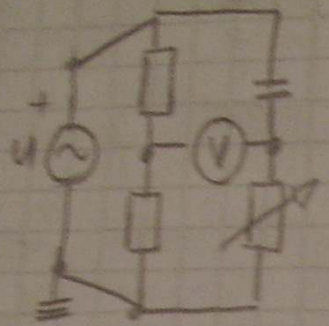
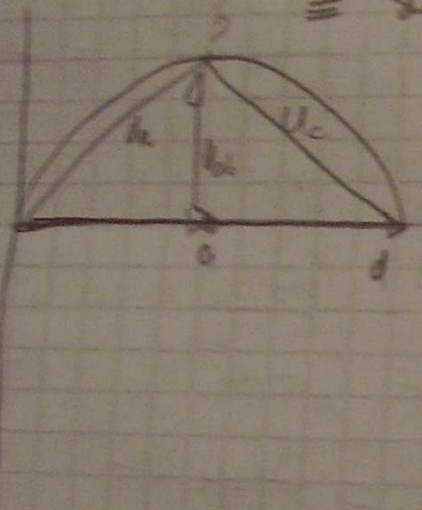
VI VJEŽBA

TOPOGRAFSKI I MJESNI DIJAGRAM

① $R = X_L$
$U = 50\,V$





② a) $\underline{z}_1 = 5 + j5 \quad \underline{z}_2 = 5 + j5$

$$\underline{Y} = \frac{1}{5+j5} + \frac{1}{5+j5} = \frac{2}{5+j5} \cdot \frac{5-j5}{5-j5}$$

$$= \frac{10-10j}{50} = \frac{1-j}{5}$$

$$Z = \frac{5}{1} \cdot \frac{1+j}{1+j} = \frac{5+5j}{2} = 2{,}5 + 2{,}5j$$

b) $\underline{z}_1 = 5 + j5 \quad \underline{z}_2 = 5 - j5$

$$Y = \frac{1}{5+j5} + \frac{1}{5-j5} = \frac{5-j5}{50} + \frac{5+j5}{50}$$

$$= \frac{1}{5} \qquad Z = \frac{1}{Y} = 5\,\Omega + j0$$

c) $\underline{z}_1 = 5 + j5 \quad \underline{z}_2 = 15 + j15$

$$\underline{Y} = \frac{1}{5+j5} + \frac{1}{15+j15} = \frac{5-j5}{50} + \frac{15-j15}{450}$$

$$= \frac{1-1}{10} + \frac{1-1}{30} = \frac{4-4j}{30} = \frac{2-2j}{15}$$

$$Z = \frac{15}{2-2j} = \frac{30+30j}{8} = 3{,}75 + 3{,}75j$$

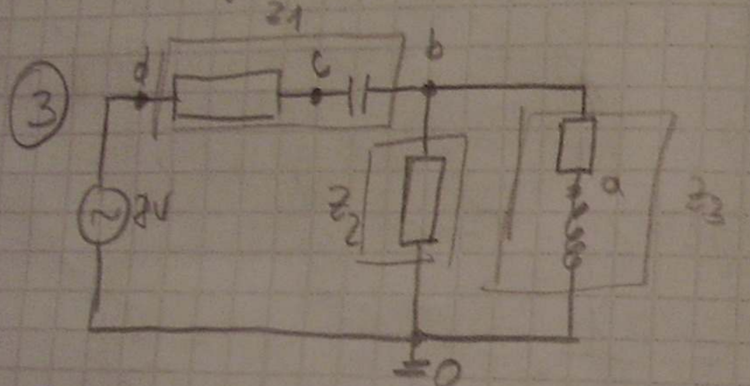
d) $Z_1 = 5+j5 \quad Z_2 = 5+j0\,\Omega$

$$Y = \frac{1}{5+j5} + \frac{1}{5} = \frac{5-j5}{50} + \frac{1}{5}$$

$$= \frac{15-j5}{50} = \frac{3-j}{10}$$

$$Z = \frac{10}{3-j} = \frac{10(3+j)}{10} = \frac{30+10j}{10} = 3+j$$

③



$U = 8V$

$R_1 = 5, \; X_C = 1 \quad R_2 = 5, \; R_3 = 5, \; X_L = 5$

$Z_1 = 5-j$

$Z_2 = 5+0j$

$Z_3 = 5+5j$

$$Y = \frac{1}{5} + \frac{1}{5+5j} = \frac{1}{5} + \frac{5-5j}{50}$$

$$= \frac{15-5j}{50} = \frac{3-j}{10}$$

$$Z = \frac{1}{Y} = \frac{10}{3-j} = \frac{30+10j}{10} = 3+j$$

$Z_u = 5-j+3+j = 8$

$$I = \frac{U}{Z} = 1\,A$$

bez topografije

:P

$U_{dc} = R_1 \cdot I = 5V$

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④

$I = 2A$

$Z_u = 8\Omega$

$U = 2A \cdot 8\Omega = 16V$

$U_{R_1} = 2A \cdot 5\Omega = 10V$

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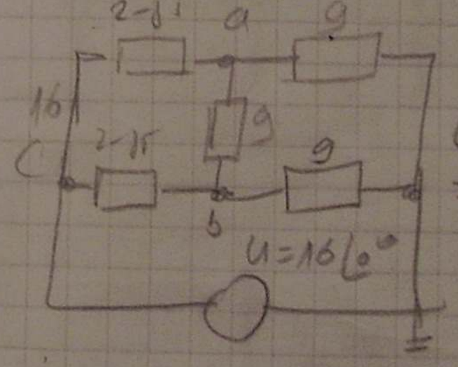
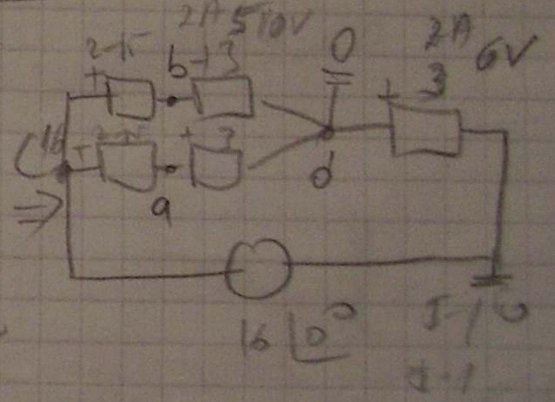
⑤





$Z_1 = 5+j5$

$Z_2 = 5-j5$

$$Y = \frac{1}{5+j5} + \frac{1}{5-j5} =$$

$$Y = \frac{10}{50} = \frac{1}{5}$$

$Z = 5$

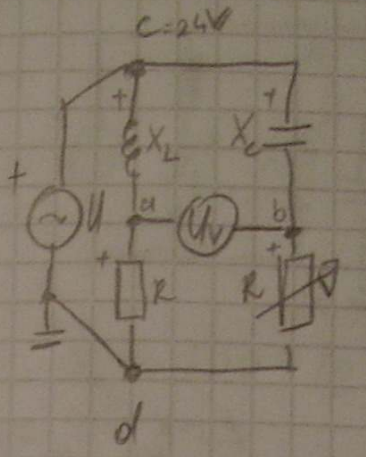
$Z_u = 8$

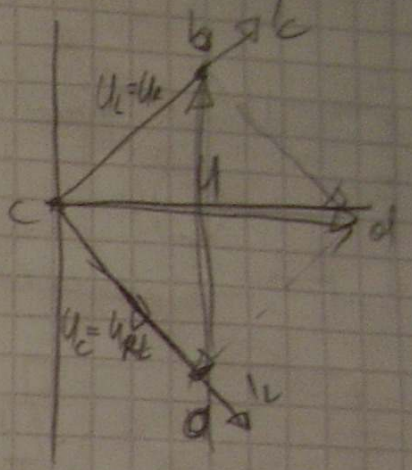
a) $I = \frac{U}{Z} = \frac{16}{8} = 2A$

b) struja je u fazi s naponom

c)

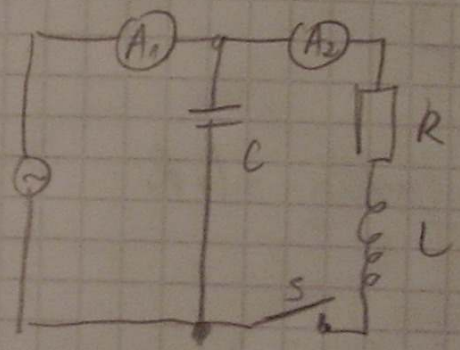
(6)



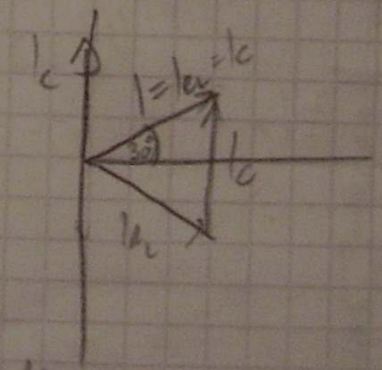


$U_V = U = 24V$

(7)



$U = 110V$
$f = 60Hz$
$I = 0,1A$



$Z_n = \frac{U}{I} =$

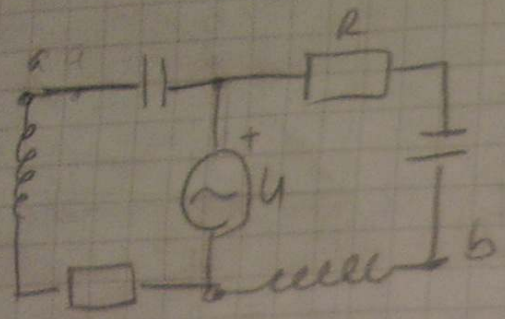
$= \frac{110V}{0,1A} = 1100\Omega$

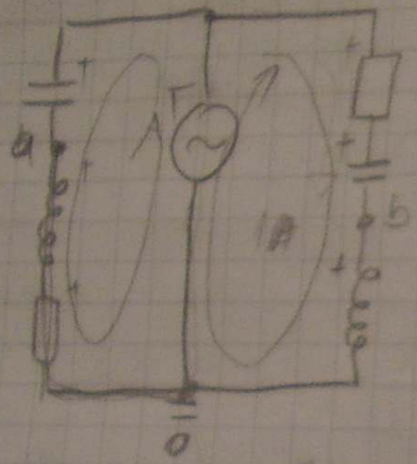
$X_C = Z_{RL} \sin 30° = 1100\Omega$

$Z = Z_{RL} \cos 30° = 150\Omega$

$L = \frac{X_L}{\omega} = 0,29\Omega$

⑧





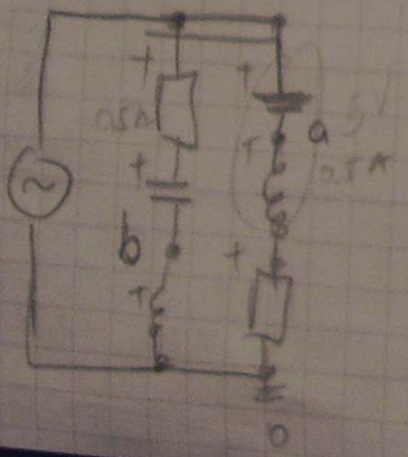
$R = X_L = X_C = 10\Omega$

$U = 10V$

$Z = 10\Omega$

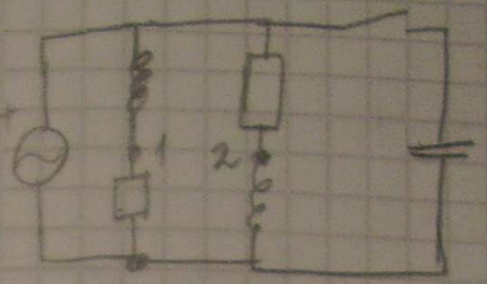
$10V = -1 \cdot jX_C + 1 \cdot jX_L + 1 \cdot R$

$I = 1A$



$U_{ab} = 5V - 5V = 10V$

⑨



$U_{1L} = 100V \angle 0°$ – otvorena sklopka

$R = X_L = X_C$