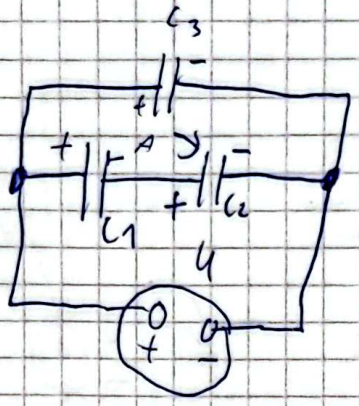
2. kol. 24/25

1. $C_1 = C_2 = 5\,\mu F$,

$C_3 = 9\,\mu F$

$U = 10\,V$



a) $C' = ?$

b) $e_1, e_2, e_3 = ?$

c) naboj na A. c) +

a) Gl vondelnatorja vezana zap.

$$\frac{1}{C''} = \frac{1}{C_1} + \frac{1}{C_2} = \frac{1}{C_1} + \frac{1}{C_1} = \frac{2}{C_1}$$

$$C'' = \frac{C_1}{2}$$

$$C' = C'' + C_3 = \frac{C_1}{2} + C_3 = 11{,}5\,\mu F$$

b)

$e_3 = C_3 U_3 = 90\,\mu As$ $\quad U_3 = U$ $\quad e_1 = e_2$ $\quad C_1 = C_2$

$e_2 = C_2 U_2$ & $U - U_2 - U_1 = 0$ $\quad U - \frac{2e_1}{C_1} = 0$

$e_1 = C_1 U_1$ $\quad U_0 - \frac{e_1}{C_1} - \frac{e_2}{C_2} = 0$ $\quad e_1 = \frac{UC_1}{2}$

$e_2 = e_1 = 25\,\mu As$

2. kol 24/25

nal. 4.

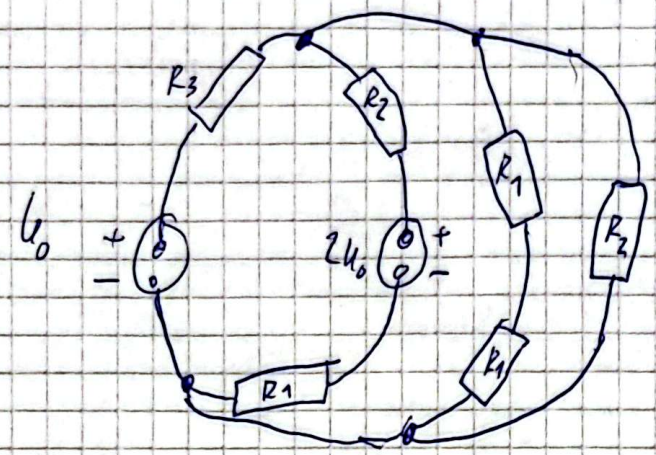
$U_0 = 2V$

$R_1 = 7\Omega$

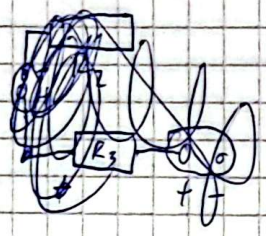
$R_2 = 2\Omega$

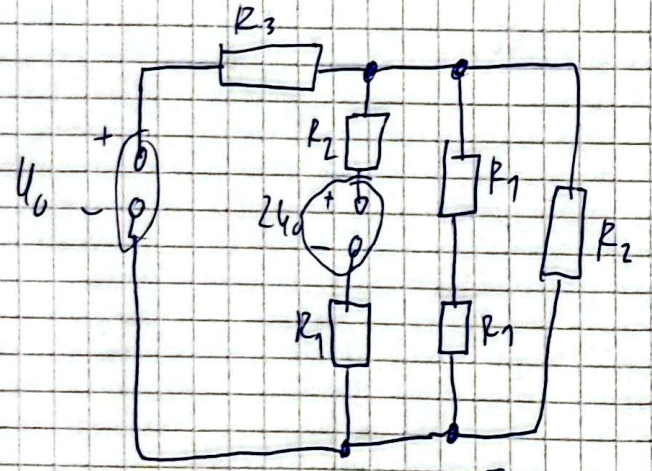
$R_3 = 3\Omega$

$P_3 = ?$

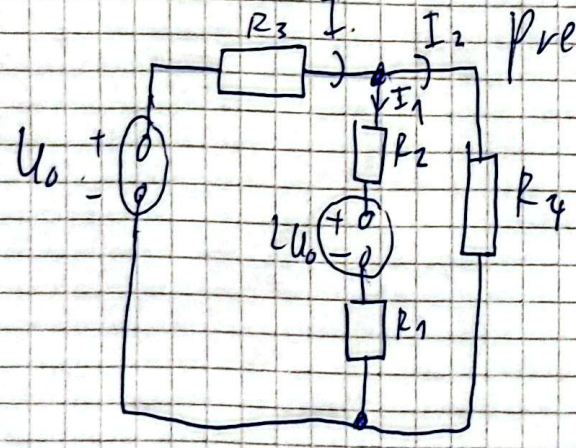


$\Rightarrow$





$\Rightarrow$



predelamo na to obliko nato Kirchoff.

$$\frac{1}{R_4} = \frac{1}{R_2} + \frac{1}{2R_1} \qquad R_2 = 2R_1$$

$$\frac{1}{R_4} = \frac{1}{2\Omega} + \frac{1}{2\Omega} = \frac{2}{2\Omega} \Rightarrow R_4 = 1\,\Omega$$

$$I = I_1 + I_2$$

① $U_0 - IR_3 - I_2R_4 = 0 \qquad I_2 = I - I_1$

② ~~$2U_0 - R_1 I_1$~~

$$U_0 - R_3 I - R_2 I_1 - 2U_0 - R_1 I_1 = 0$$

$$-U_0 - R_3 I - R_2 I_1 - R_1 I_1 = 0$$

$$U_0 - IR_3 - IR_4 + I_1 R_4 = 0$$

$$I_1 = \frac{IR_3 + IR_4 - U_0}{R_4}$$

$$-U_0 - R_3 I - \frac{(R_2+R_1)}{R_4}(IR_3 + IR_4 - U_0) = 0$$

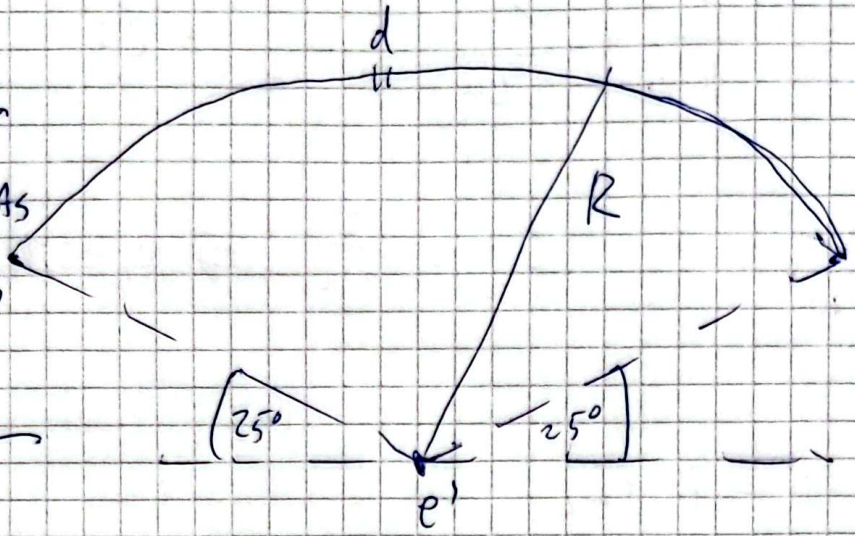
$$R_3 I + \frac{(R_2+R_1)}{R_4} R_3 I + \frac{(R_2+R_1)}{R_4} R_4 I = \frac{U_0(R_2+R_1)}{R_4} - U_0$$

$$I = U_0 \left(\frac{(R_2+R_1)}{R_4} - 1\right) \frac{1}{\left(R_3 + \frac{(R_2+R_1)R_3}{R_4} + (R_2+R_1)\right)}$$

$$I = \frac{4}{15}\,A \qquad P = I^2 \cdot R_3 = \frac{16}{75}\,W = 0{,}213\,W$$

24/25

2. kol. 5. nal.



$R = 5\,cm$

$e = 700\,\mu As$

$e' = 3\,\mu As$

$d = 1\,mm$

$|F_d| = ?$

$\vec{F}_{cel} = ?$

$\frac{73R}{73q} = \frac{13}{73}$

$\lambda = \frac{e}{L}$ $\quad dL = R \cdot d\varphi$ $\quad L = R \cdot \frac{\varphi}{180^\circ} \cdot \pi$

$\varphi = \frac{13}{18}\pi$

$|F_d| = \frac{\lambda \cdot d \cdot e'}{4\pi\varepsilon_0 R^2} = 9{,}57\,N$ $\quad L_d = R\pi\frac{13}{73}$

$\vec{F}_{cel} = ?$ $\longrightarrow$ samo y smer zaradi simetrije.

sila na de.

$de = \lambda \cdot R \cdot d\varphi$

$d\vec{F} = \frac{e' \cdot de}{4\pi\varepsilon_0 R^2}\frac{\vec{r}}{r}$

$d\vec{F} = \frac{e'\lambda\, d\varphi}{4\pi\varepsilon_0 R^2}\frac{\vec{r}}{r}$ $\quad \frac{\vec{r}(\varphi)}{r} = (\cos\varphi, \sin\varphi)$

$d\vec{F} = \frac{e'\lambda\, d\varphi}{4\pi\varepsilon_0 R} \cdot (\cos\varphi, \sin\varphi)$

$\int_0^{F_x} dF_x = \int_{25^\circ}^{155^\circ} \frac{e'\lambda\, d\varphi}{4\pi\varepsilon_0 R}\cos\varphi$ $\quad \int_0^{F_y} dF_y = \int_{25^\circ}^{155^\circ} \frac{e'\lambda\, d\varphi}{4\pi\varepsilon_0 R}\sin\varphi$

$F_x = 0$

$F_y = -\frac{e'\lambda}{4\pi\varepsilon_0 R}\cos\varphi\Big|_{25^\circ}^{155^\circ} = \cdot 1713\,N.$

$F_y = \frac{e'\lambda}{4\pi\varepsilon_0 R} \cdot (\cos(25^\circ) - \cos(155^\circ))$