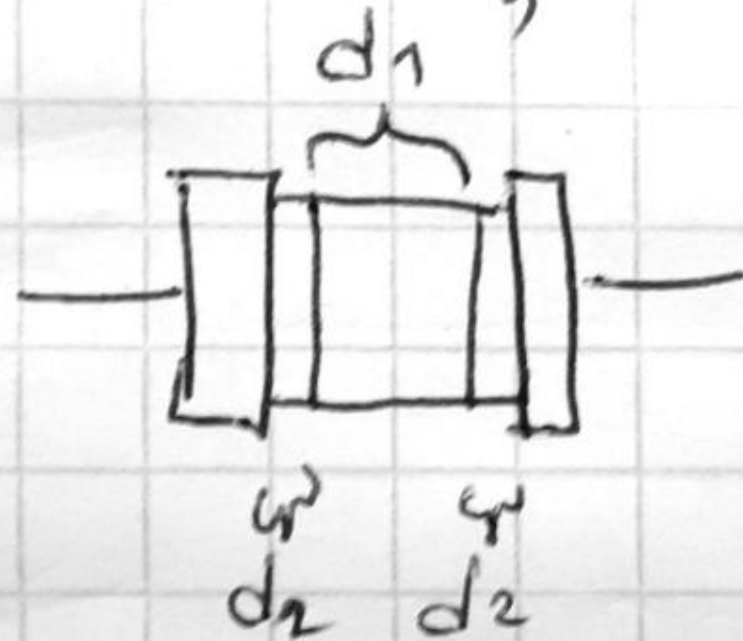


cvičení 5

$$\epsilon_0 = 8,854 \cdot 10^{-12} \frac{F}{m}$$

N2. $C = ?$ $S = 0,02 \text{ m}^2$, $d_1 = 0,001 \text{ m}$, $d_2 = 0,2 \cdot 10^{-3} \text{ m}$, $\epsilon_1 = 7$

$$\epsilon_2 = 2$$



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

$$C_1 = \frac{\epsilon_1 \epsilon_0 S}{d_1}, \quad C_2 = \frac{\epsilon_1 \epsilon_0 S}{d_1}$$

$$C = \frac{C_1 \cdot C_2}{2C_1 + C_2} = \frac{\epsilon_1 \epsilon_2 \epsilon_0^2 S^2}{d_1 d_2} \cdot \frac{1}{\epsilon_0 S \left(\frac{2\epsilon_1 d_2 + \epsilon_2 d_1}{d_1 d_2} \right)} = \frac{\epsilon_1 \epsilon_2 \epsilon_0 S}{2\epsilon_1 d_2 + \epsilon_2 d_1}$$

$$C = \frac{7 \cdot 2 \cdot 8,854 \cdot 10^{-12} \frac{F}{m} \cdot 0,02 \text{ m}^2}{2 \cdot 7 \cdot 0,2 \cdot 10^{-3} \text{ m} + 2 \cdot 10^{-3} \text{ m}} = 5,164 \cdot \mu\text{F}$$

úloha 7

N4.

$$U = 220 \text{ V}$$

$$\alpha = 0,0045 \text{ K}^{-1}$$

$$t_1 = 20^\circ \text{C}$$

$$t_2 = 2500^\circ \text{C}$$

$$I_1 = ?$$

$$I_2 = 0,272 \text{ A}$$

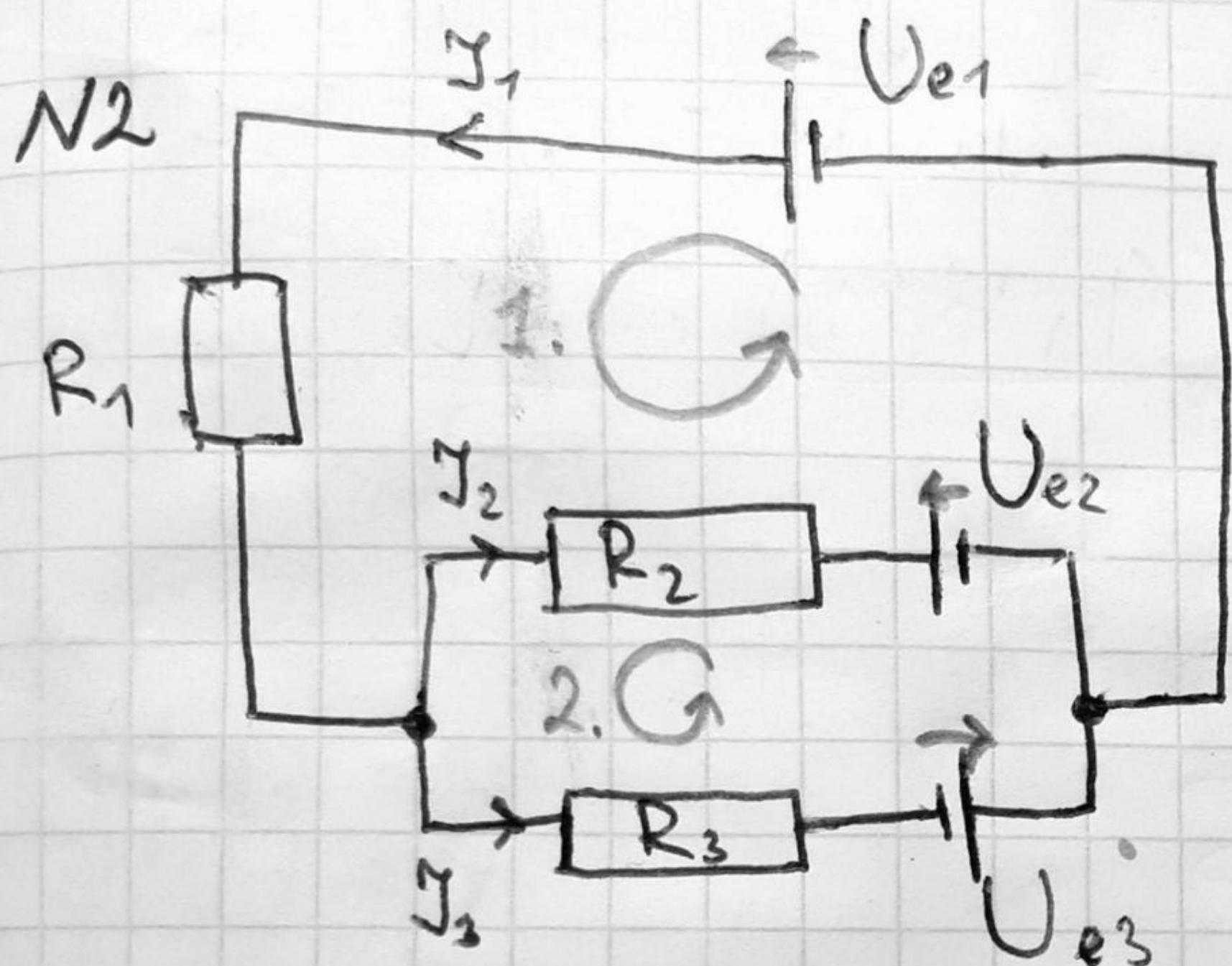
$$U = I_1 R_1 = I_2 R_2$$

$$\alpha = \frac{\Delta R}{R_1 \Delta t}$$

$$R_2 = R_1 (1 + \alpha \Delta t)$$

$$I_1 = \frac{I_2 R_2}{R_1} = \frac{I_2 R_1 (1 + \alpha \Delta t)}{R_1} = 0,272 \text{ A} (1 + 0,0045 \text{ K}^{-1} \cdot (2500 - 20)) =$$
$$\underline{\underline{3,3 \text{ A}}}$$

Účební 6



a) $\sum_i I_i = 0$

b) $\sum U_{ei} = \sum I_i R_i$

označíme směr 1. a 2.

$$I_1 = I_2 + I_3$$

1. $U_{e1} - U_{e2} = I_1 R_1 + I_2 R_2$

2. $U_{e2} + U_{e3} = I_3 R_3 - I_2 R_2$

$$I_2 = \frac{I_3 R_3 - U_{e2} - U_{e3}}{R_2}$$

$$U_{e1} - U_{e2} = \left(\frac{I_3 R_3 - U_{e2} - U_{e3}}{R_2} + I_3 \right) R_1 + \frac{I_3 R_3 - U_{e2} - U_{e3}}{R_2} \cdot R_2$$

$$8V = \left(\frac{I_3 \cdot 10\Omega - 10V}{12\Omega} + I_3 \right) 20\Omega + (I_3 \cdot 10\Omega - 10V)$$

$$8 = \frac{100I_3 + 120I_3}{6} - \frac{100}{6} + 10I_3 - 10$$

$$I_3 = \frac{104}{3} \cdot \frac{6}{280} \approx 0,7429A$$

$$I_2 = \frac{0,7429A \cdot 10\Omega - 10V}{12\Omega} \approx -0,214A$$

$$I_1 = 0,5286A$$

záporná hodnota proudu I_2 znamená, že vybraný smer na schématu je opačný.
 proudu I_2