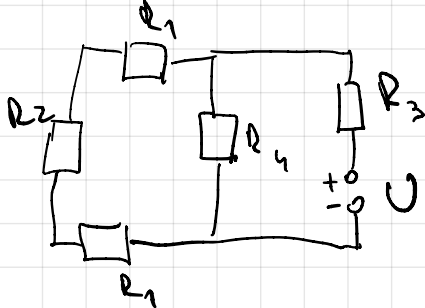


Podano je mreža na slici. $R_1 = 1\Omega$, $R_2 = 2\Omega$, $R_3 = 3\Omega$ i $R_4 = 4\Omega$.

Napetost $U = 7V$.

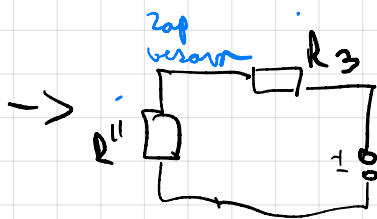
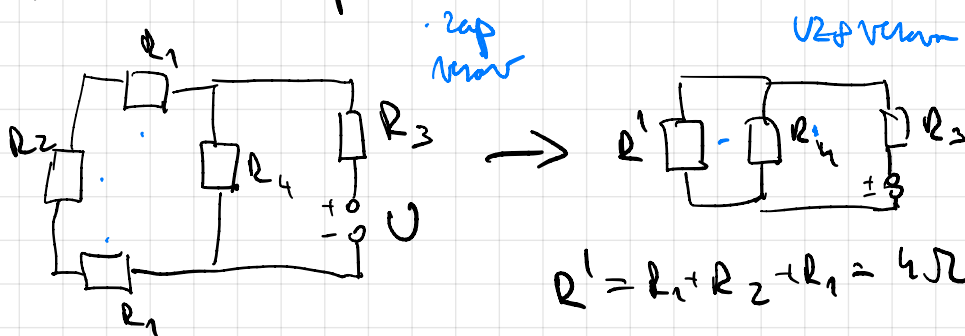


a) Kolikšen je naponovni upor?

b) Kolikšen tok teče čez R_4 ?

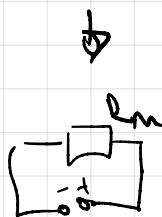
c) Kolikšna moč se troši na R_3 ?

a) naponovni upor:



$$\frac{1}{R''} = \frac{1}{R'} + \frac{1}{R_3} = \frac{1}{4\Omega} + \frac{1}{4\Omega} = \frac{1}{2\Omega}$$

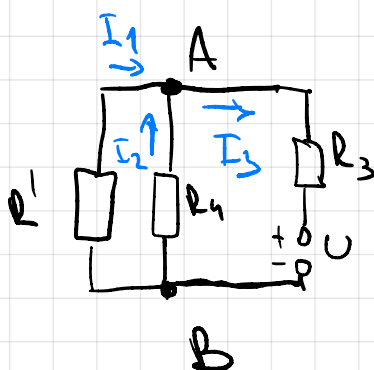
$$R'' = 2\Omega$$



$$R_n = R_3 + R'' = 3\Omega + 2\Omega = 5\Omega$$

b) kolikšen tok teče čez R_4 ?

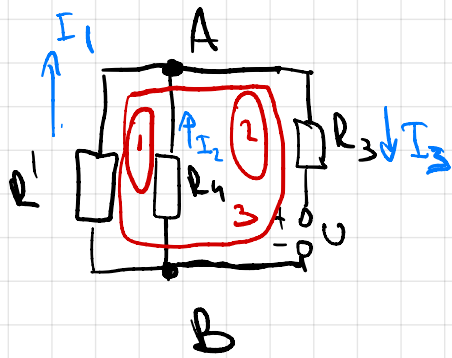
izbira sled iz naponovnih



I. Kirchhoff v stičišču

II. Kirchhoff v posrednjem

$$I.KZ: I_1 + I_2 = I_3$$



$$1: R_1 I_1 - I_2 R_4 = 0$$

$$2: I_2 R_4 + I_3 R_3 - U = 0$$

$$3: I_1 R_1 + I_3 R_3 - U = 0$$

Zunächst mit I_2 !

we machen

$$I_1 + I_2 = I_3$$

$$R_1 I_1 - R_4 I_2 = 0$$

$$R_4 I_2 + R_3 I_3 - U = 0$$

$$R_1 I_1 + R_3 I_3 - U = 0$$

$$R_1 I_1 = R_4 I_2$$

$$I_1 = \frac{R_4}{R_1} I_2$$

$$\text{Nehmen wir I.K.Z.: } I_1 + I_2 = I_3$$

$$\frac{R_4}{R_1} I_2 + I_2 = I_3$$

$$\rightarrow I_3 = I_2 \left(1 + \frac{R_4}{R_1} \right)$$

Nehmen wir ein

$$R_4 I_2 + R_3 I_2 \left(1 + \frac{R_4}{R_1} \right) - U = 0$$

$$I_2 \left(R_4 + R_3 + \frac{R_3 R_4}{R_1} \right) = U$$

$$I_2 = \frac{U}{R_4 + R_3 + \frac{R_3 R_4}{R_1}} = \frac{7V}{4\Omega + 3\Omega + \frac{4 \cdot 3 \Omega^2}{4\Omega}}$$

$$= \frac{7V}{10\Omega} = \underline{\underline{0.7A}}$$

c) haben noch Relation von R_3 ? nehmen I_2 Relation zu I_3

$$I_3 = I_2 \left(1 + \frac{4\Omega}{3\Omega} \right) = \frac{7}{3} I_2 = \underline{\underline{1.63A}}$$

$$P_3 = R_3 I_3^2 = 3\Omega \cdot (1.63)^2 = \underline{\underline{7.97W}}$$

