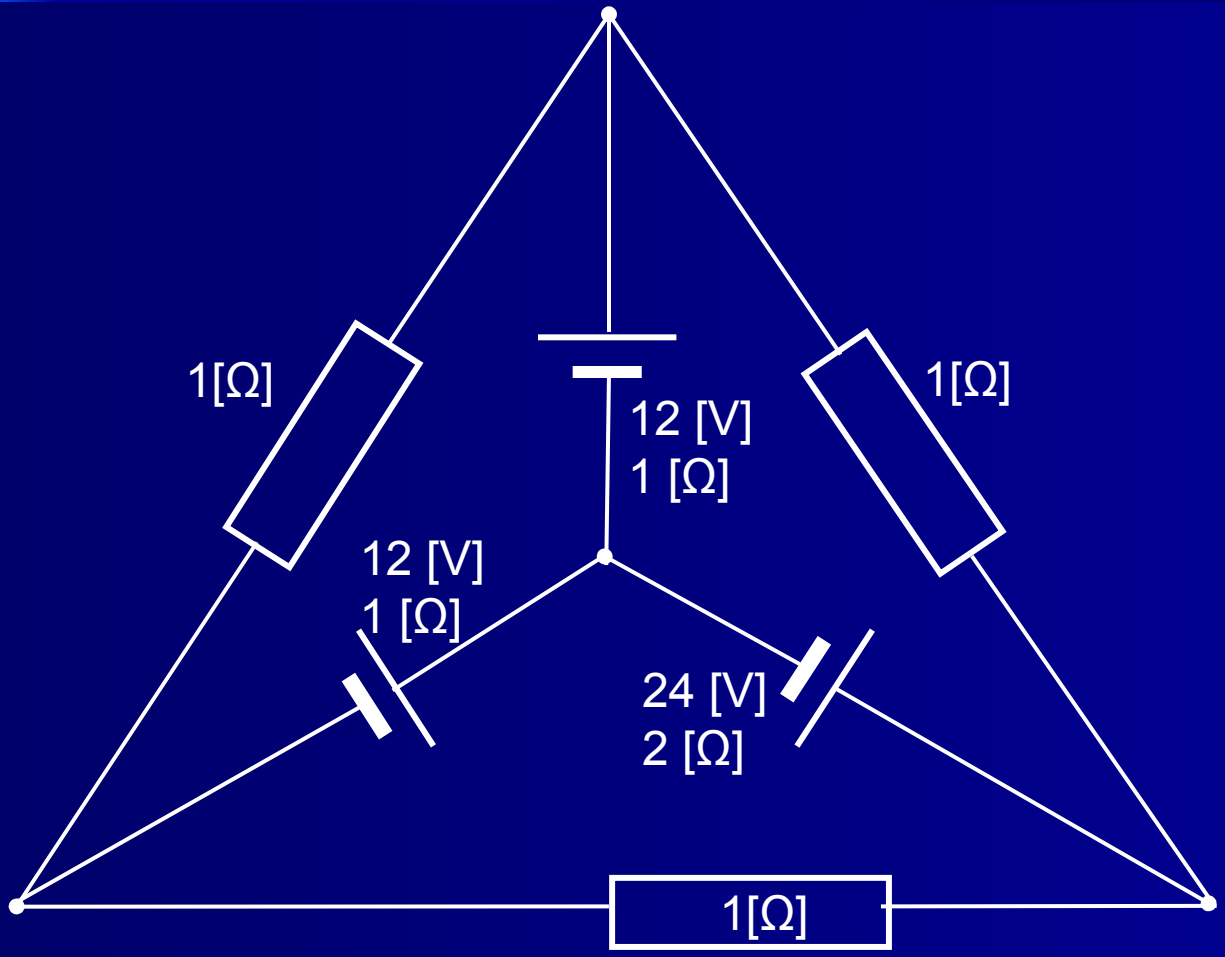
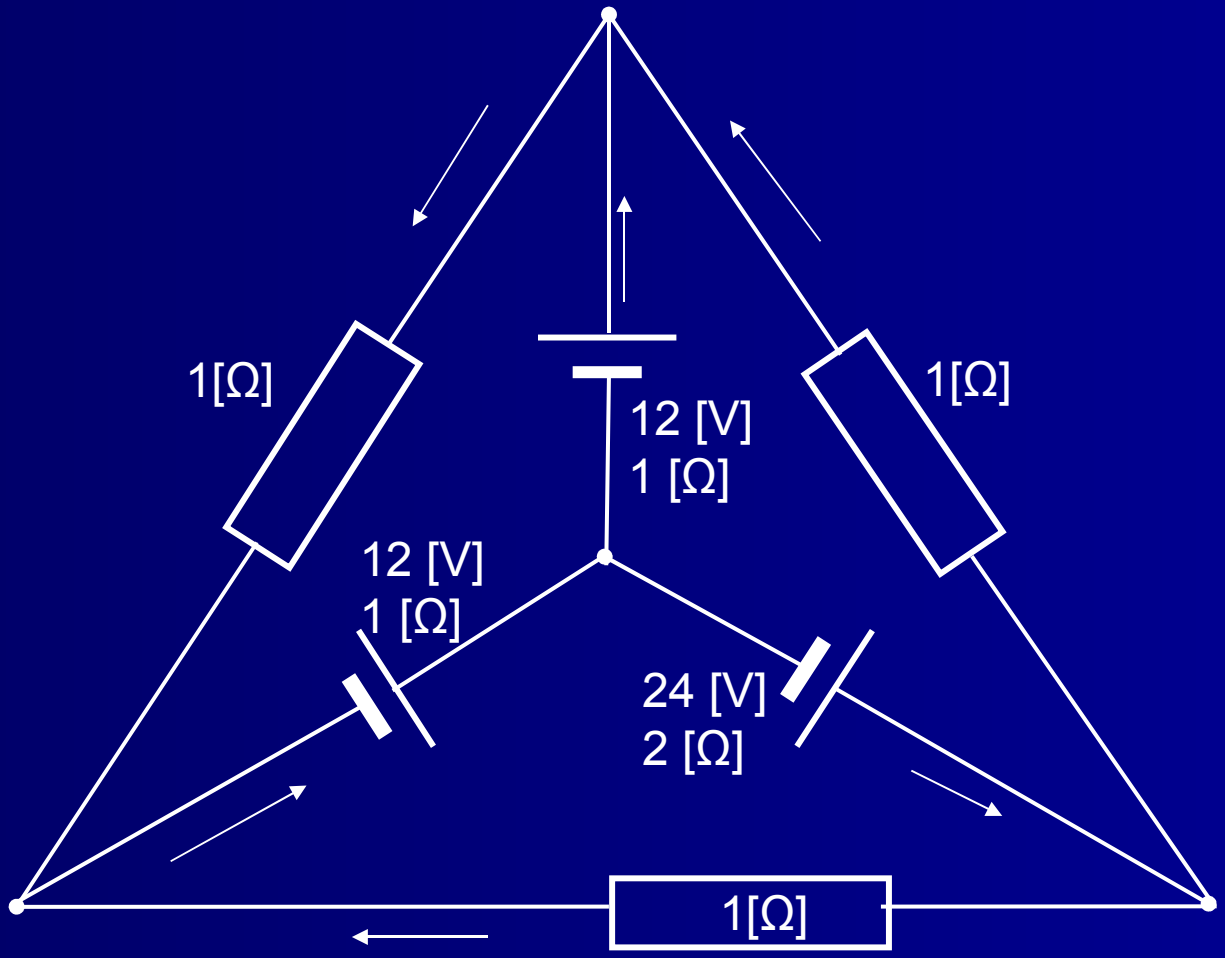
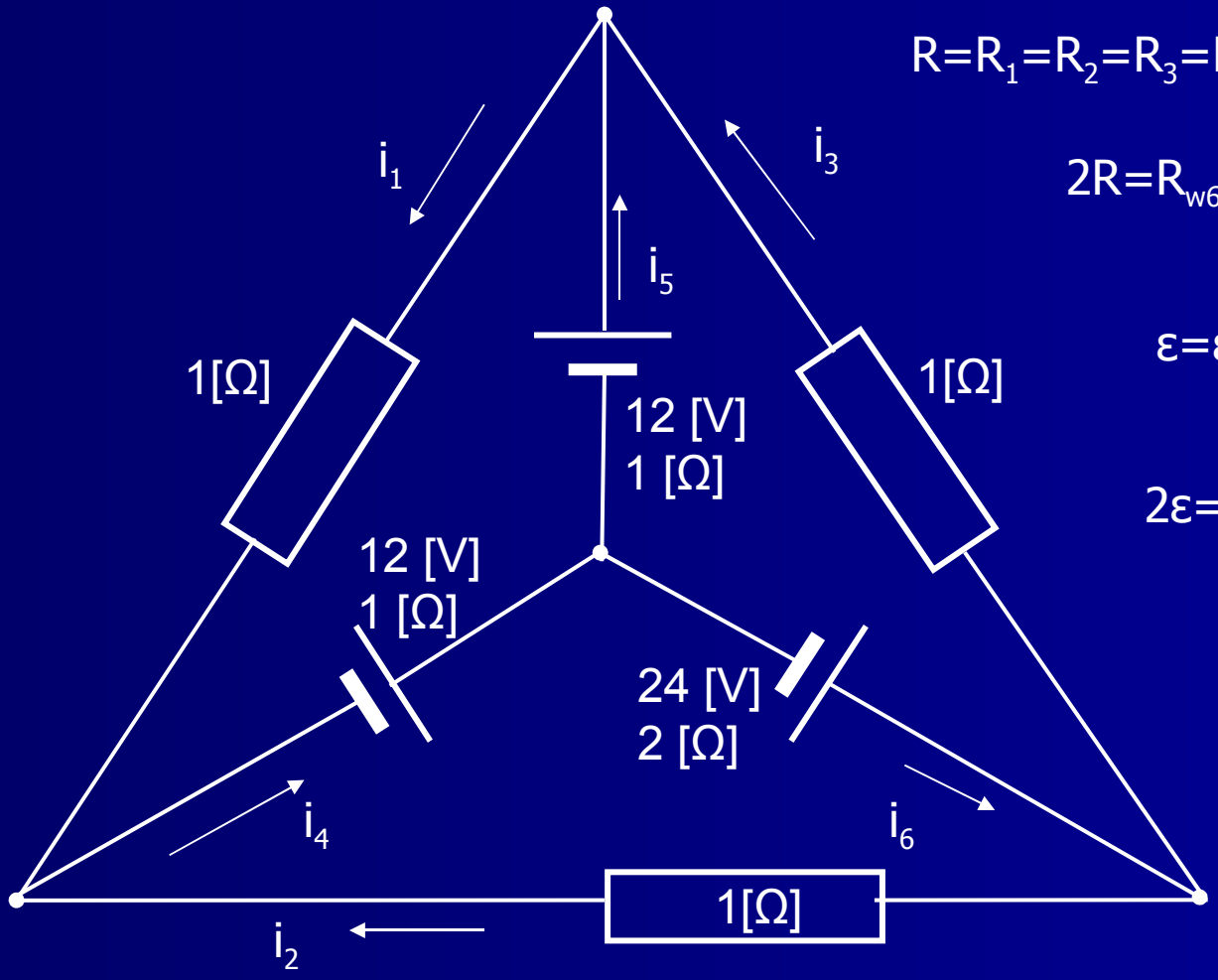
Ćwiczenie 6



Ćwiczenie 6



Ćwiczenie 6



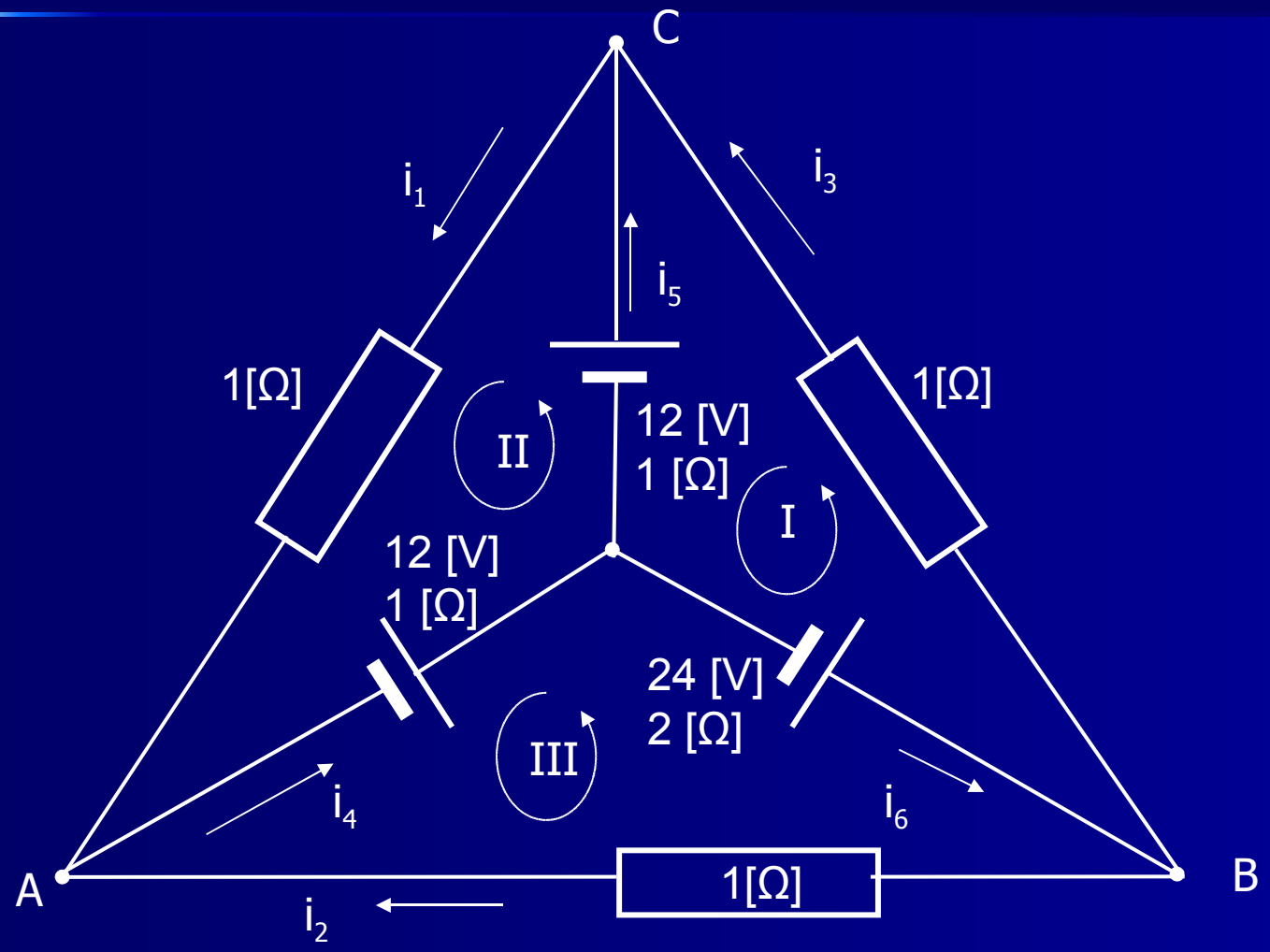
$R=R_1=R_2=R_3=R_{w4}=R_{w5}=1[\Omega]$

$2R=R_{w6}=2[\Omega]$

$\varepsilon=\varepsilon_5=\varepsilon_4=12[V]$

$2\varepsilon=\varepsilon_6=24[V]$

Ćwiczenie 6



Ćwiczenie 6

$$(A)\quad i_4 = i_1 + i_2 \qquad (I)\quad 2\varepsilon - \varepsilon = 2Ri_6 + Ri_3 - Ri_5$$

$$(B)\quad i_6 = i_2 + i_3 \qquad (II)\quad \varepsilon + \varepsilon = Ri_4 + Ri_5 + Ri_1$$

$$(C)\quad i_1 = i_3 + i_5 \qquad (III)\quad \varepsilon + 2\varepsilon = 2Ri_6 + Ri_2 + Ri_4$$

Ćwiczenie 6

$$\frac{\varepsilon}{R} = 2i_2 + 2i_3 + i_3 - i_1 + i_3 \qquad \frac{\varepsilon}{R} = -i_1 + 2i_2 + 4i_3$$

$$2\frac{\varepsilon}{R} = i_1 + i_2 + i_1 - i_3 + i_1 \qquad 2\frac{\varepsilon}{R} = 3i_1 + i_2 - i_3$$

$$3\frac{\varepsilon}{R} = 2i_2 + 2i_3 + i_2 + i_1 + i_2 \qquad 3\frac{\varepsilon}{R} = i_1 + 4i_2 + 2i_3$$

Ćwiczenie 6

$$i_3 = 3i_1 + i_2 - 2\frac{\varepsilon}{R}$$

$$\frac{\varepsilon}{R} = -i_1 + 2i_2 + 12i_1 + 4i_2 - 8\frac{\varepsilon}{R} \qquad 9\frac{\varepsilon}{R} = 11i_1 + 6i_2$$

$$3\frac{\varepsilon}{R} = i_1 + 4i_2 + 6i_1 + 2i_2 - 4\frac{\varepsilon}{R} \qquad 7\frac{\varepsilon}{R} = 7i_1 + 6i_2$$

Ćwiczenie 6

$$i_2 = 1{,}5\frac{\varepsilon}{R} - \frac{11}{6}i_1$$

$$7\frac{\varepsilon}{R} = 7i_1 + 9\frac{\varepsilon}{R} - 11i_1$$

$$i_1 = \frac{\varepsilon}{2R} = \frac{12[V]}{2[\Omega]} = 6[A]$$

Ćwiczenie 6

$$i_1 = \frac{\varepsilon}{2R} = \frac{12[V]}{2[\Omega]} = 6[A]$$

$$i_2 = 1{,}5\,\frac{12[V]}{1[\Omega]} - \frac{11}{6}\,6[A] = 18[A] - 11[A] = 7[A]$$

$$i_3 = 3 \bullet 6[A] + 7[A] - 2\,\frac{12[V]}{1[\Omega]} = 25[A] - 24[A] = 1[A]$$

Ćwiczenie 6

$$i_4 = 6[A] + 7[A] = 13[A]$$

$$i_5 = 6[A] - 1[A] = 5[A]$$

$$i_6 = 7[A] + 1[A] = 8[A]$$

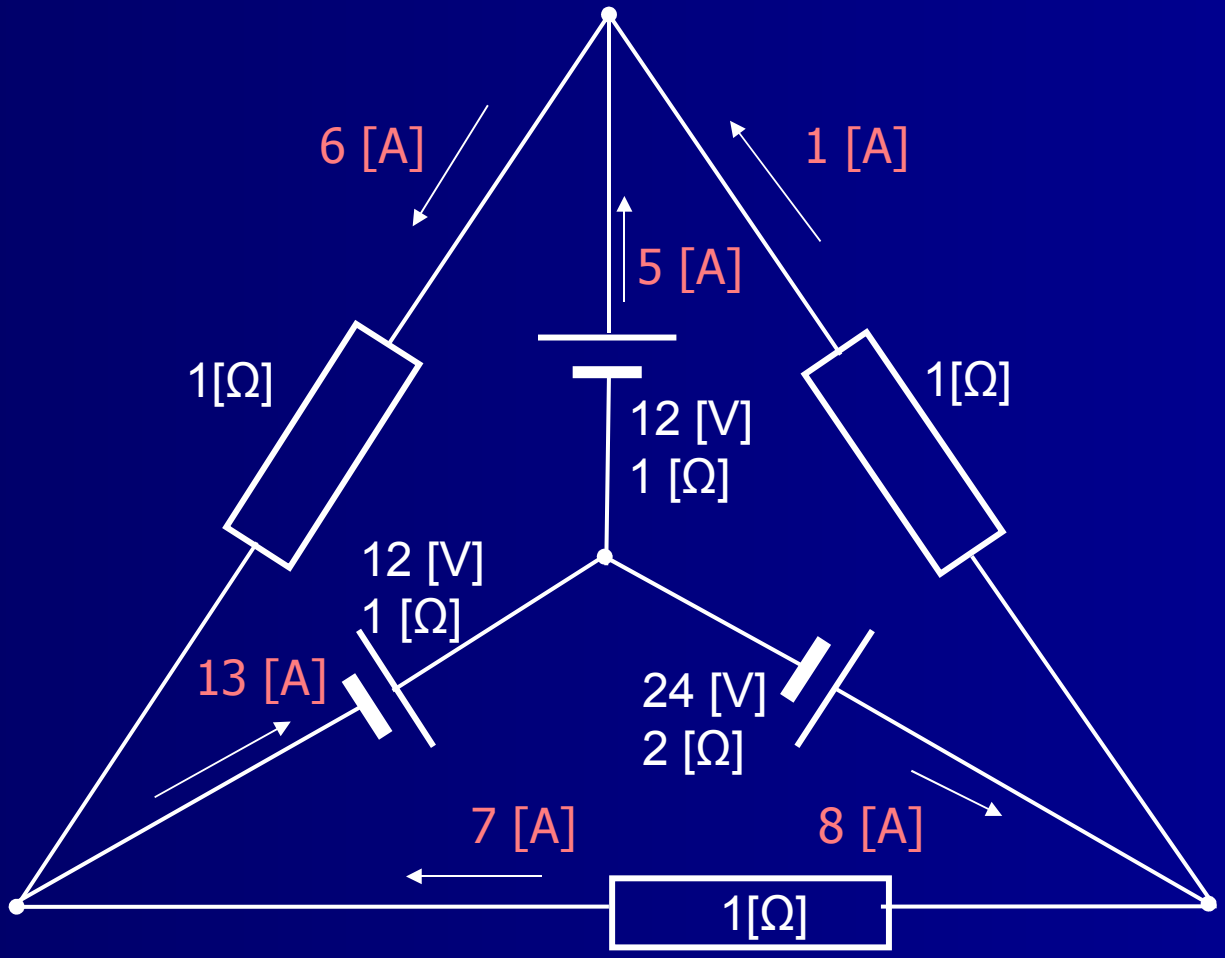
Ćwiczenie 6

$$(I) \quad \frac{12[V]}{1[\Omega]} = 12[A] \qquad -6[A] + 2 \cdot 7[A] + 4 \cdot 1[A] = 12[A]$$

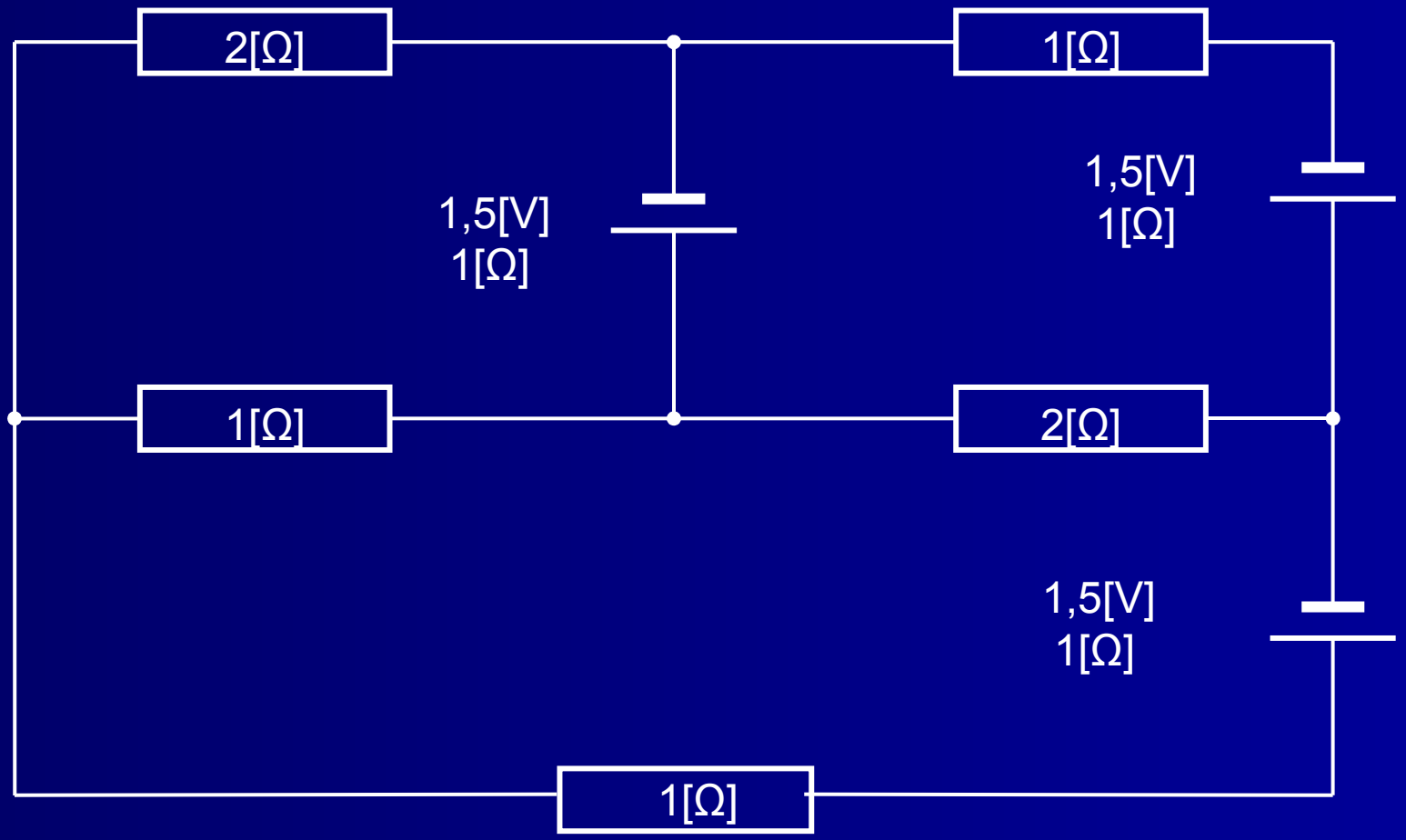
$$(II) \quad 2\frac{12[V]}{1[\Omega]} = 24[A] \qquad 3 \cdot 6[A] + 7[A] - 1[A] = 24[A]$$

$$(III) \quad 3\frac{12[V]}{1[\Omega]} = 36[A] \qquad 6[A] + 4 \cdot 7[A] + 2 \cdot 1[A] = 36[A]$$

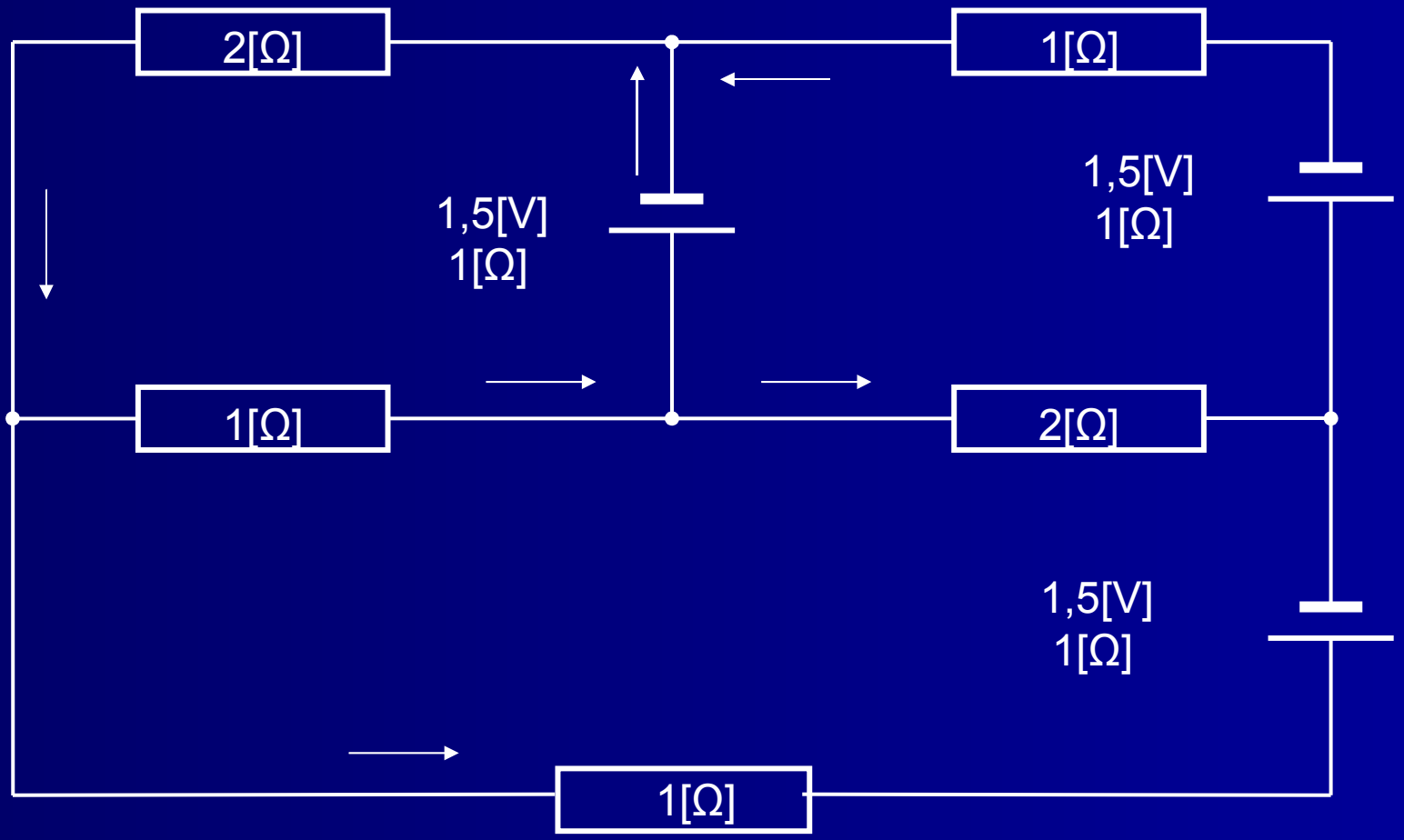
Ćwiczenie 6



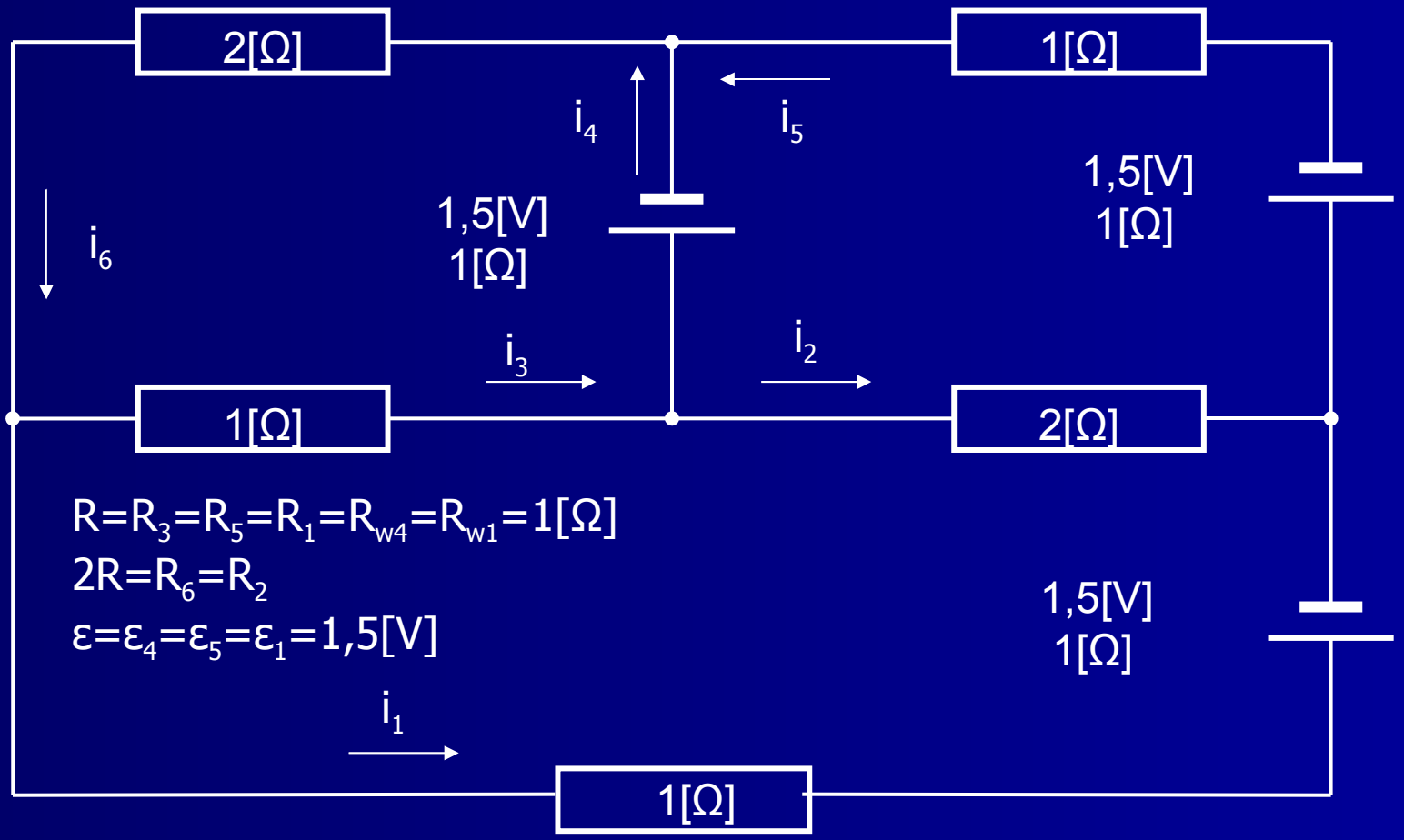
Ćwiczenie 6



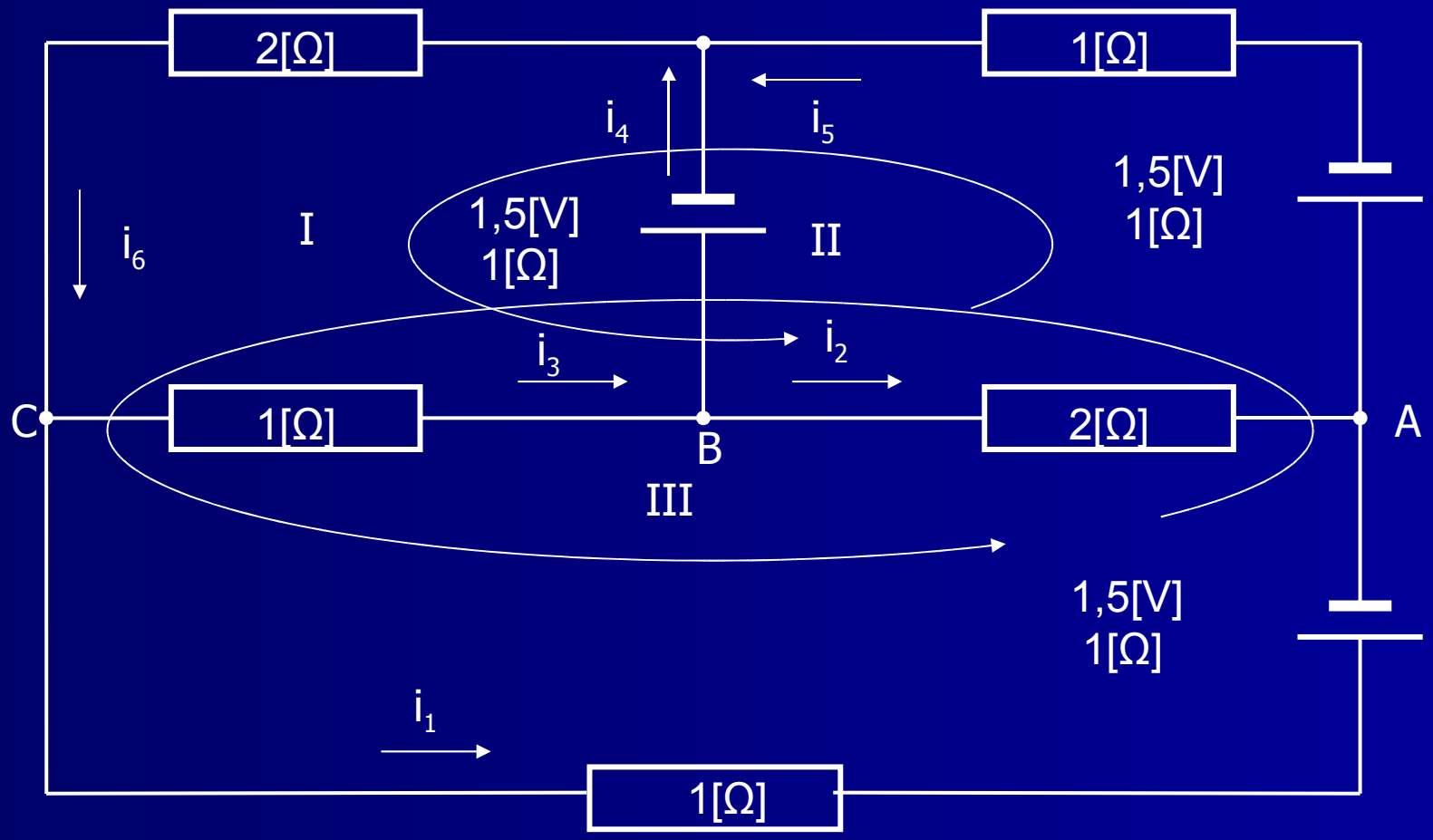
Ćwiczenie 6



Ćwiczenie 6


2[Ω]
1[Ω]
i4
i5
1,5[V]
1[Ω]
i6
1,5[V]
1[Ω]
i3
i2
1[Ω]
2[Ω]
R=R3=R5=R1=Rw4=Rw1=1[Ω]
2R=R6=R2
ε=ε4=ε5=ε1=1,5[V]
1,5[V]
1[Ω]
i1
1[Ω]

Ćwiczenie 6



Ćwiczenie 6

$$(A)\quad i_5 = i_1 + i_2 \qquad (I)\quad \varepsilon = 2Ri_6 + Ri_4 + Ri_3$$

$$(B)\quad i_3 = i_2 + i_4 \qquad (II)\quad \varepsilon = 2Ri_6 + 2Ri_5 + Ri_3 + 2Ri_2$$

$$(C)\quad i_6 = i_1 + i_3 \qquad (III)\quad 2\varepsilon = 2Ri_1 + 2Ri_5 + 2Ri_6$$

Ćwiczenie 6

$$\frac{\varepsilon}{R} = 2i_1 + 2i_3 + i_3 - i_2 + i_3 \qquad \frac{\varepsilon}{R} = 2i_1 - i_2 + 4i_3$$

$$\frac{\varepsilon}{R} = 2i_1 + 2i_3 + 2i_1 + 2i_2 + i_3 + 2i_2 \qquad \frac{\varepsilon}{R} = 4i_1 + 4i_2 + 3i_3$$

$$2\frac{\varepsilon}{R} = 2i_1 + 2i_1 + 2i_2 + 2i_1 + 2i_3 \qquad 2\frac{\varepsilon}{R} = 6i_1 + 2i_2 + 2i_3$$

Ćwiczenie 6

$$i_3 = \frac{\varepsilon}{R} - i_2 - 3i_1$$

$$\frac{\varepsilon}{R} = 2i_1 - i_2 - 4i_2 - 12i_1 + 4\frac{\varepsilon}{R} \qquad 3\frac{\varepsilon}{R} = 10i_1 + 5i_2$$

$$\frac{\varepsilon}{R} = 4i_1 + 4i_2 - 3i_2 - 9i_1 + 3\frac{\varepsilon}{R} \qquad 2\frac{\varepsilon}{R} = 5i_1 - i_2$$

Ćwiczenie 6

$$i_2 = 5i_1 - 2\frac{\varepsilon}{R} \qquad 3\frac{\varepsilon}{R} = 10i_1 + 5 \bullet 5i_1 - 5 \bullet 2\frac{\varepsilon}{R}$$

$$i_1 = \frac{13\varepsilon}{35R} = \frac{19{,}5[V]}{35[\Omega]} = 0{,}557[A]$$

Ćwiczenie 6

$$i_1 = \frac{13\varepsilon}{35R} = \frac{19{,}5[V]}{35[\Omega]} = 0{,}557[A]$$

$$i_2 = 5 \bullet 0{,}557[A] - 2\frac{1{,}5[V]}{1[\Omega]} = -0{,}214[A]$$

$$i_3 = \frac{1{,}5[V]}{1[\Omega]} + 0{,}214[A] - 3 \bullet 0{,}557[A] = 0{,}043[A]$$

Ćwiczenie 6

$$i_4 = 0{,}043[A] - \left(-\,0{,}214[A]\right) = 0{,}257[A]$$

$$i_5 = 0{,}557[A] + \left(-\,0{,}214[A]\right) = 0{,}343[A]$$

$$i_6 = 0{,}557[A] + 0{,}043[A] = 0{,}6[A]$$

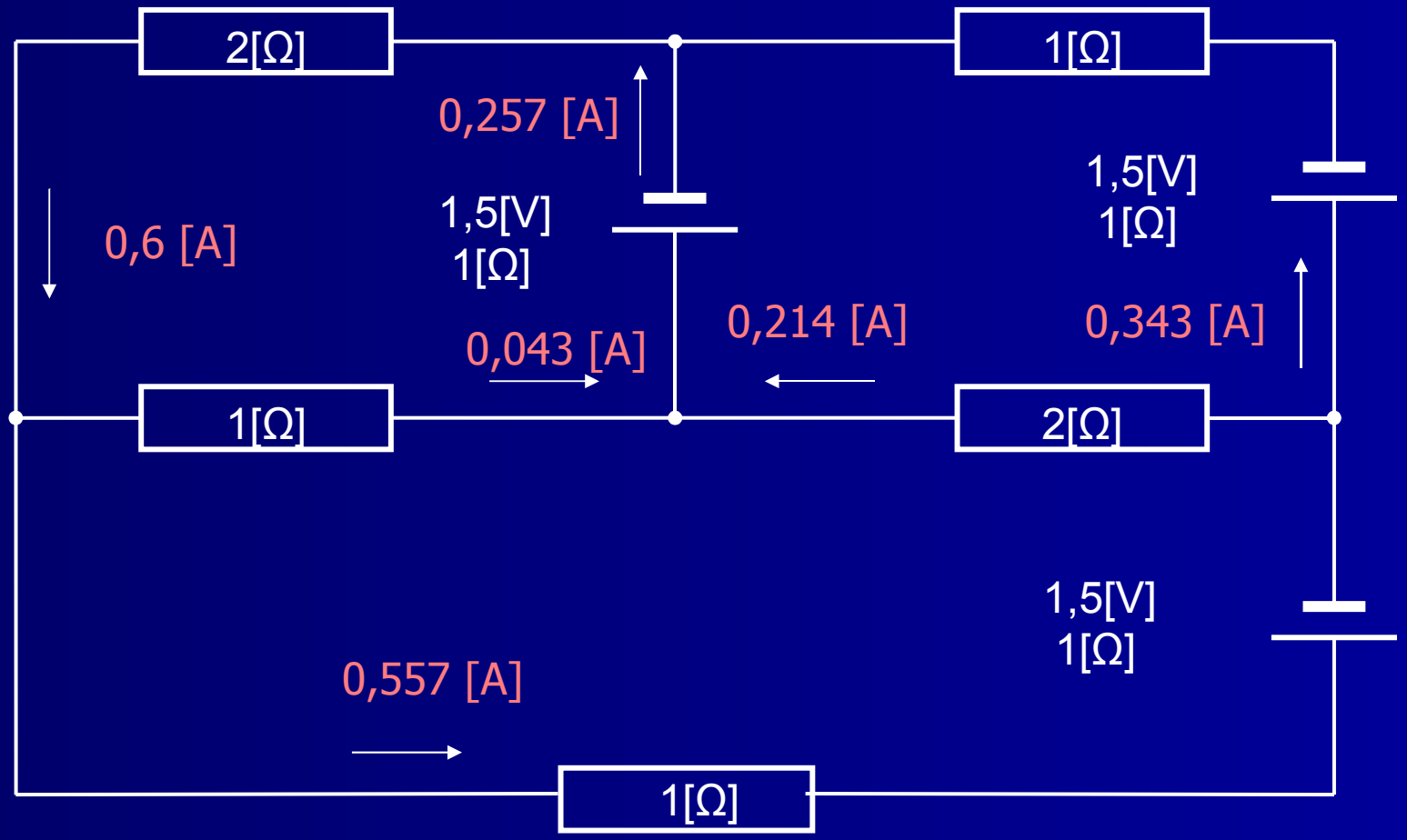
Ćwiczenie 6

$$(I)\quad \frac{1{,}5[V]}{1[\Omega]} = 1{,}5[A] \qquad 2 \cdot 0{,}6[A] + 0{,}257[A] + 0{,}043[A] = 1{,}5[A]$$

$$(II)\quad \frac{1{,}5[V]}{1[\Omega]} = 1{,}5[A] \qquad 2 \cdot 0{,}6[A] + 2 \cdot 0{,}343[A] + 0{,}043[A] - 2 \cdot 0{,}214[A] = 1{,}5[A]$$

$$(III)\quad 2\frac{1{,}5[V]}{1[\Omega]} = 3[A] \qquad 2 \cdot 0{,}557[A] + 2 \cdot 0{,}343[A] + 2 \cdot 0{,}6[A] = 3[A]$$

Ćwiczenie 6


2[Ω]
1[Ω]
0,257 [A]
1,5[V]
1[Ω]
0,6 [A]
1,5[V]
1[Ω]
0,214 [A]
0,343 [A]
0,043 [A]
1[Ω]
2[Ω]
1,5[V]
1[Ω]
0,557 [A]
1[Ω]