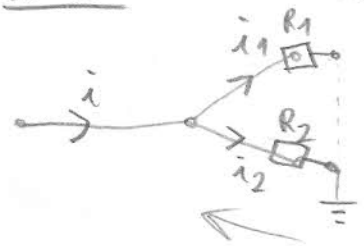
15.13



Dane: $i = 1{,}2\ A$ $\quad R_1 = 4{,}8\ \Omega$ $\quad R_2 = 7{,}2\ \Omega$

$i = i_1 + i_2$ $\quad U = i_1 \cdot R_1$ $\quad U = i_2 \cdot R_2$

$i = U \cdot G$ $\quad G = \frac{1}{4{,}8} + \frac{1}{7{,}2}$ [S]

$i_1 = \frac{U}{R_1}$ $\quad i_2 = \frac{U}{R_2}$

$i = \frac{U}{R_1} + \frac{U}{R_2}$ $\quad U = i_1 R_1$ $\quad U = i_2 \cdot R_2$ $\quad U = i \cdot \frac{R_1 + R_2}{R_1 + R_2}$

$i = \frac{U \cdot R_2}{R_1 \cdot R_2} + \frac{U \cdot R_1}{R_1 \cdot R_2}$

$i \cdot \frac{R_1 \cdot R_2}{R_1 + R_2} = i_1 R_1 \quad / : R_1$

$i_1 = \frac{R_2}{R_1 + R_2} \cdot i$

$i_1 = 0{,}6\, i$ $\quad i_2 = 0{,}4\, i$

$i_1 = 0{,}72\ A$ $\quad i_2 = 0{,}48\ A$ ✓

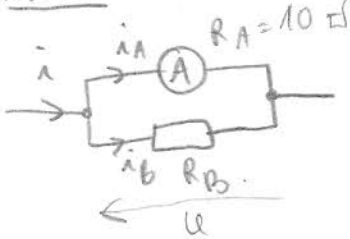
$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$

$\frac{1}{R} = \frac{R_2}{R_1 \cdot R_2} + \frac{R_1}{R_1 \cdot R_2}$

$\frac{1}{R} = \frac{R_1 + R_2}{R_1 \cdot R_2}$

$R = \frac{R_1 \cdot R_2}{R_1 + R_2}$ $\left[\frac{\Omega \cdot \Omega}{\Omega}\right]$

15.14



$i_{A\max} = 3\ mA = 3 \cdot 10^{-3}\ A$ $\quad i_{max} = 1{,}5\ A$

$i = U \cdot \frac{R_A + R_B}{R_A \cdot R_B}$ $\quad i_A = \frac{U}{R_A}$ $\quad i_B = \frac{U}{R_B}$

$U = i \cdot \frac{R_A \cdot R_B}{R_A + R_B}$ $\quad U = i_A \cdot R_A$

$i_A \cdot R_A = i \cdot \frac{R_A \cdot R_B}{R_A + R_B} \quad / : R_A$

$i_A = i \cdot \frac{R_B}{R_A + R_B}$

$i_A (R_A + R_B) = i R_B \quad / : R_B$

$i_A \cdot \frac{(R_A + R_B)}{R_B} = i \quad / : i_A$

$\frac{R_A}{R_B} + \frac{R_B}{R_B} = \frac{i}{i_A}$

$\frac{R_A}{R_B} + 1 = \frac{i}{i_A}$

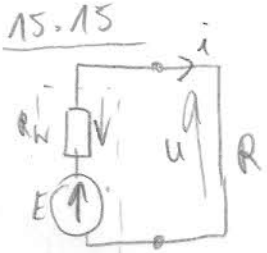
$\frac{R_A}{R_B} = \frac{i}{i_A} - 1 \quad / : R_A$

$\frac{1}{R_B} = \frac{(\frac{i}{i_A} - 1)}{R_A}$

$R_B = \frac{R_A}{(\frac{i}{i_A} - 1)}$

$R_B \approx 0{,}2\ \Omega$ ← rezystancja bocznika

15.15



$E = 1{,}08\ V \quad R_W = 1{,}5\ \Omega \quad R = 12\ \Omega$

$$i = \frac{E}{R_W + R}$$

$$i = \frac{1{,}08}{1{,}5 + 12} = 0{,}08\ A$$

$i = 0{,}08\ A$ ✓

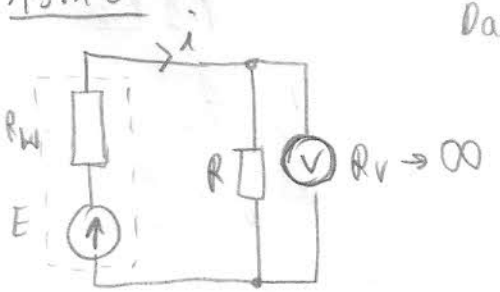
$U = E - i \cdot R_W$

$U = 1{,}08 - 0{,}08 \cdot 1{,}5$

$U = 1{,}08 - 0{,}012$

$U = 0{,}96\ V$ ✓

15.16



Dane: $i = 0{,}2\ A \quad R_W = 0{,}6\ \Omega \quad U = 1{,}8\ V$

$$i = \frac{E}{R_W + R}$$

$U = E - i \cdot R_W \qquad U = i \cdot R$

$\downarrow$

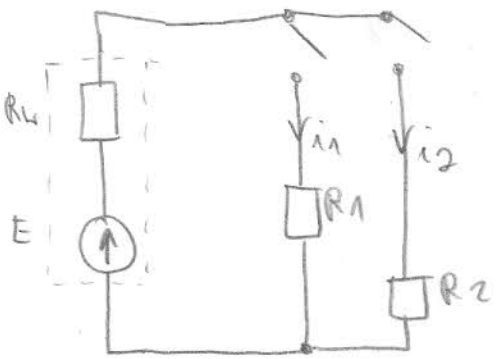
$E = U + i \cdot R_W$

$E = 1{,}8 + 0{,}2 \cdot 0{,}6$

$E = 1{,}8 + 0{,}12 = 1{,}92\ V$

$E = 1{,}92\ V$ ✓

15.17



Dane:

$i_1 = 0{,}6\ A \quad R_1 = 2\ \Omega$

$i_2 = 0{,}1\ A \quad R_2 = 14{,}5\ \Omega$

$$i_1 = \frac{E}{R_W + R_1} \qquad i_2 = \frac{E}{R_W + R_2}$$

$U = E - i_1 \cdot R_W \qquad U = E - i_2 \cdot R_W$

$E = i_1 \cdot R_1 + i_1 \cdot R_W \qquad E = i_2 \cdot R_2 + i_2 \cdot R_W$

$i_1 \cdot R_1 + i_1 \cdot R_W = i_2 \cdot R_2 + i_2 \cdot R_W$

$i_1 \cdot R_W - i_2 \cdot R_W = i_2 \cdot R_2 - i_1 \cdot R_1$

$R_W (i_1 - i_2) = i_2 \cdot R_2 - i_1 R_1$

$$R_W = \frac{i_2 \cdot R_2 - i_1 \cdot R_1}{(i_1 - i_2)}$$

$$R_W = \frac{1{,}45 - 1{,}2}{0{,}6 - 0{,}1} = \frac{0{,}25}{0{,}5} = \frac{1}{4} \cdot \frac{2}{1} = \frac{1}{2}$$

$R_W = 0{,}5\ \Omega$ ✓

$E = i_1 \cdot R_1 + i_1 \cdot R_W$

$E = 1{,}2 + 0{,}6 \cdot 0{,}5$

$E = 1{,}2 + 0{,}3$

$E = 1{,}5\ V$ ✓