## Aufgabe 1

$$R_{ges} = R_1 + R_2 = 1\,k\Omega + 2\,k\Omega = 3\,k\Omega$$

$$I_{ges} = \frac{U_{ges}}{R_{ges}} = \frac{6\,V}{3\,k\Omega} = 2\,mA$$

$$I_{ges} = I_1 = I_2$$

$$U_1 = R_1 \cdot I_1 = 1\,k\Omega \cdot 2\,mA = 2\,V$$

## Aufgabe 2

$$R_{ges} = R_1 + R_2 + R_3 = 3 \cdot 1\,k\Omega = 3\,k\Omega$$

$$I_{ges} = \frac{U_{ges}}{R_{ges}} = \frac{9\,V}{3\,k\Omega} = 3\,mA = I_1 = I_2 = I_3$$

$$U_1 = R_1 \cdot I_1 = 1\,k\Omega \cdot 3\,mA = 3\,V = U_2 = U_3$$

da $R_1 = R_2 = R_3 \Rightarrow U_1 = U_2 = U_3$

## Aufgabe 3

$$R_{ges} = R_1 + R_2 = 1\,\Omega + 100\,\Omega = 101\,\Omega$$

$$I_{ges} = \frac{U_{ges}}{R_{ges}} = \frac{20\,V}{101\,\Omega} = 0{,}198\,A = I_1 = I_2$$

$$U_2 = R_2 \cdot I_2 = 100\,\Omega \cdot 0{,}198\,A = 19{,}8\,V$$

## Aufgabe 4

$$R_{ges} = R_1 + R_2 = 100\,k\Omega + 1\,M\Omega = 1{,}1\,M\Omega$$

$$I_{ges} = \frac{U_{ges}}{R_{ges}} = \frac{20\,V}{1{,}1\,M\Omega} = 18{,}18\,\mu A = I_1 = I_2$$

$$U_2 = R_2 \cdot I_2 = 1\,M\Omega \cdot 18{,}18\,\mu A = 18{,}18\,V$$

# Aufgabe 5

$$U_{ges} = U_1 + U_2 + U_3$$
$$= 3{,}33V + 5{,}81V + 0{,}85V$$
$$= 9{,}99\,V$$

$$I_{ges} = I_1 = I_2 = I_3$$

$$I_1 = \frac{U_1}{R_1} = \frac{3{,}33V}{4{,}7\,k\Omega} = 0{,}7085\,mA = I_{ges}$$

oder $I_2 = \frac{U_2}{R_2}$ oder $I_3 = \frac{U_3}{R_3}$

# Aufgabe 6

$$R_{ges} = R_1 + R_2 \qquad R_{ges} = \frac{U_{ges}}{I_{ges}} = \frac{12\,V}{10{,}4\,mA}$$

$$R_2 = R_{ges} - R_1 \qquad R_{ges} = 1{,}154\,k\Omega$$

$$R_2 = 1{,}154\,k\Omega - 470\,\Omega$$

$$R_2 = 684\,\Omega$$

# Aufgabe 7

da $R_1 = R_2 \Rightarrow R_{ges} = \frac{R_1}{2}$ oder $\frac{R_2}{2} = \frac{4{,}4\,k\Omega}{2} = 2{,}2\,k\Omega$

$$I_{ges} = \frac{U_{ges}}{R_{ges}} = \frac{8\,V}{2{,}2\,k\Omega} = 3{,}6\overline{3}\,mA$$

$$I_1 = I_2 \Rightarrow I_1 = \frac{I_{ges}}{2} = \frac{3{,}6\overline{3}\,mA}{2} = 1{,}8\overline{1}\,mA$$

# Aufgabe 8

$$U_{ges} = U_1 = U_2 = U_3$$

$$I_{ges} = I_1 + I_2 + I_3$$

$$I_1 = \frac{U_1}{R_1} = \frac{6\,V}{100\,\Omega} = 0{,}06\,A$$

$$I_2 = \frac{U_2}{R_2} = \frac{6\,V}{1\,k\Omega} = 0{,}006\,A$$

$$I_3 = \frac{U_3}{R_3} = \frac{6\,V}{10\,k\Omega} = 0{,}0006\,A$$

$$I_{ges} = 0{,}06\,A + 0{,}006\,A + 0{,}0006\,A$$

$$I_{ges} = 66{,}6\,mA$$

$$R_{ges} = \frac{U_{ges}}{I_{ges}} = \frac{6\,V}{66{,}6\,mA} = 90{,}09\,\Omega$$

oder

$$\frac{1}{R_{ges}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

$$R_{1/2} = \frac{R_1 \cdot R_2}{R_1 + R_2} = \frac{100\,\Omega \cdot 1\,k\Omega}{1{,}1\,k\Omega} = 90{,}\overline{90}\,\Omega$$

$$R_{ges} = \frac{R_{1/2} \cdot R_3}{R_{1/2} + R_3} = \frac{90{,}\overline{90}\,\Omega \cdot 10\,k\Omega}{10{,}0\overline{90}\,k\Omega} = 90{,}09\,\Omega$$

# Aufgabe 9

da $R_1 = R_2 \Rightarrow R_{1/2} = \frac{R_1}{2} = \frac{8\,k\Omega}{2} = 4\,k\Omega$

$R_3 = R_4 \Rightarrow R_{3/4} = \frac{R_3}{2} = \frac{20\,k\Omega}{2} = 10\,k\Omega$

$R_{ges} = \frac{R_{1/2} \cdot R_{3/4}}{R_{1/2} + R_{3/4}} = \frac{4\,k\Omega \cdot 10\,k\Omega}{14\,k\Omega} = 2{,}857\,k\Omega$

$U_{ges} = U_1 = U_2 = U_3 = U_4 \; ; \; I_1 = I_2 \; ; \; I_3 = I_4$

$I_2 = \frac{U_2}{R_2} = \frac{9V}{8\,k\Omega} = 1{,}125\,mA \qquad I_4 = \frac{U_4}{R_4} = \frac{9V}{20\,k\Omega} = 0{,}45\,mA$

$I_{ges} = I_1 + I_2 + I_3 + I_4 = 2 \cdot 1{,}125\,mA + 2 \cdot 0{,}45\,mA = 3{,}15\,mA$

oder

$I_{ges} = \frac{U_{ges}}{R_{ges}} = \frac{9V}{2{,}857\,k\Omega} = 3{,}15\,mA$

# Aufgabe 10

$U_{ges} = U_1 = U_2 = U_3$

$I_{ges} = I_1 + I_2 + I_3$

$I_1 = \frac{U_1}{R_1} = \frac{15V}{1{,}8\,k\Omega} = 8{,}\overline{3}\,mA$

$I_3 = \frac{U_3}{R_3} = \frac{15V}{3{,}3\,k\Omega} = 4{,}\overline{54}\,mA$

$I_2 = I_{ges} - I_1 - I_3 = 16{,}7\,mA - 8{,}\overline{3}\,mA - 4{,}\overline{54}\,mA$

$I_2 = 3{,}8\overline{71}\,mA$

$R_2 = \frac{U_2}{I_2} = \frac{15V}{3{,}8\overline{71}\,mA} = 3{,}925\,k\Omega$