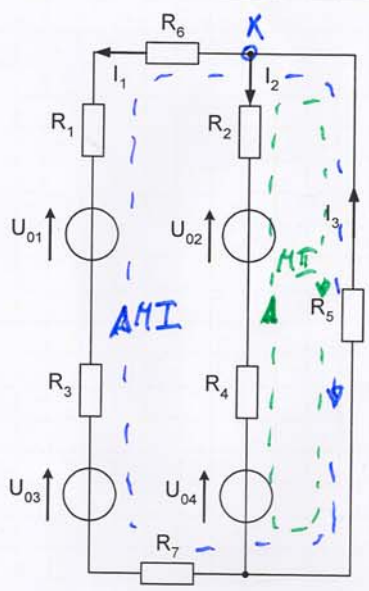
GET 1-1

1. Aufgabe



K (1) $I_1 + I_2 = I_3$ (2)

MI (2) $U_{01} + U_{03} - I_1(R_7 + R_3 + R_1 + R_6)$ (2)
$- I_3 \cdot R_5 = 0$

MII (3) $U_{02} + U_{04} - I_2(R_2 + R_4)$
$- I_3 \cdot R_5 = 0$ (2)

$U_{01} = U_{02} = U_{03} = U_{04} = 1{,}5\ V$

$R_1 = R_2 = R_3 = R_4 = 0{,}5\ \Omega$

$R_5 = 10\ \Omega$

$R_6 = R_7 = 1\ \Omega$

(2) $3\,V - I_1 \cdot 3\,\Omega - I_3 \cdot 10\,\Omega = 0$

(3) $3\,V - I_2 \cdot 1\,\Omega - I_3 \cdot 10\,\Omega = 0$

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(2) $I_1 \cdot 3\,\Omega + (I_1 + I_2) \cdot 10\,\Omega = 3\,V$

(3) $I_2 \cdot 1\,\Omega + (I_1 + I_2) \cdot 10\,\Omega = 3\,V$

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(2) $I_1 \cdot 13\,\Omega + I_2 \cdot 10\,\Omega = 3\,V$ | $(\cdot 11)$

(3) $I_1 \cdot 10\,\Omega + I_2 \cdot 11\,\Omega = 3\,V$ | $(\cdot -10)$ (8)

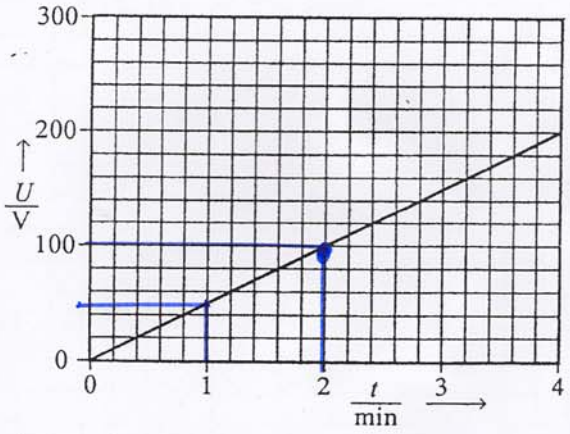
$11 \cdot (2) - 10 \cdot (3)$: $143\, I_1 \cdot \Omega - 100\, I_1 \cdot \Omega = 3\,A \cdot \Omega$

$43\, I_1 = 3\,A \longrightarrow I_1 = 69{,}8\ mA$ (2)

$\hookrightarrow I_2 = \dfrac{3\,A - 10\, I_1}{11} = 209{,}3\ mA$ (2)

$I_3 = 279{,}1\ mA$ (2)

2. Aufgabe



2.2

$U = 100\,V$ bei $t = 2\,min$

$$\frac{U}{V} = x \cdot \frac{t}{min}$$

$$100 = x \cdot 2 \rightarrow x = 50$$

$$\frac{U}{V} = 50 \cdot \frac{t}{min} \quad (4)$$

2.1 (2)

$$R = \frac{\ell}{K \cdot A} = \frac{8{,}4\,m}{21 \cdot 10^3\,S \cdot 0{,}8\,mm^2} \cdot \frac{10^{-2}\,m}{10^{-6}\,m^2}$$

$$R = \frac{8{,}4 \cdot 10^{-2}\,\Omega}{21 \cdot 10^3 \cdot 0{,}8 \cdot 10^{-6}} = 5\,\Omega = R \quad (2)$$

2.3

$$P = \frac{U^2}{R} = \frac{(50\,V)^2 \cdot \left(\frac{t}{min}\right)^2}{5\,\Omega} = 500\,W \cdot \left(\frac{t}{min}\right)^2 \quad (2)$$

$$\rightarrow \frac{P}{W} = 500 \left(\frac{t}{min}\right)^2 \quad (2)$$

2.4

$$W = \int_0^t P\,dt = \int_0^t 500\,W \cdot \frac{1}{min^2} \cdot t^2\,dt \quad (2)$$

$$= 500\,\frac{W}{min^2} \cdot \frac{t^3}{3} = \frac{500\,W}{min^2 \cdot 3} \cdot \frac{60s}{min} \cdot t^3 \quad (2)$$

$$= 10^4 \cdot Ws \cdot \frac{t^3}{min^3} \rightarrow \frac{W}{J} = 10^4 \cdot \left(\frac{t}{min}\right)^3 \quad (2)$$