1. Falsche Batterie

$$R = 100\ \Omega; \quad R_i = 0.1\ \Omega; \quad U_1 = U_2 = 1.5\ \mathrm{V}$$

a)

$$\begin{boxed}
\begin{aligned}
M_1: &\quad U_1 - R_i(I_1 + I_2) - U_2 = 0 \\
M_2: &\quad U_1 - R_i I_1 - IR = 0 \\
M_3: &\quad U_2 - R_i I_2 - IR = 0 \\
K_1: &\quad I_1 + I_2 = I
\end{aligned}
\end{boxed}$$

b)

$$\begin{aligned}
U &= \underline{\underline{1.499\ \mathrm{V}}} \\
I &= \tfrac{U}{R} = \underline{\underline{14.99\ \mathrm{mA}}} \\
P &= UI = \underline{\underline{22.49\ \mathrm{mW}}}
\end{aligned}$$

c) $U_1 = 1.5\ \mathrm{V}; \quad U_2 = 1.2\ \mathrm{V}$

$$\begin{aligned}
U &= \underline{\underline{1.199\ \mathrm{V}}} \\
I &= \tfrac{U}{R} = \underline{\underline{11.99\ \mathrm{mA}}} \\
P &= UI = \underline{\underline{14.38\ \mathrm{mW}}}
\end{aligned}$$

d)

$$\begin{aligned}
I_1 &= \underline{\underline{1.51\ \mathrm{A}}} \\
I_2 &= \underline{\underline{-1.49\ \mathrm{A}}}
\end{aligned}$$

2. Umladen von Kondensatoren

$$m = 5\ \mathrm{kg}; \quad k = 2\ \mathrm{N/m}; \quad a = 0.1\ \mathrm{m}; \quad h = 0.4\ \mathrm{m}; \quad l = 0.1\ \mathrm{m}$$

a)