

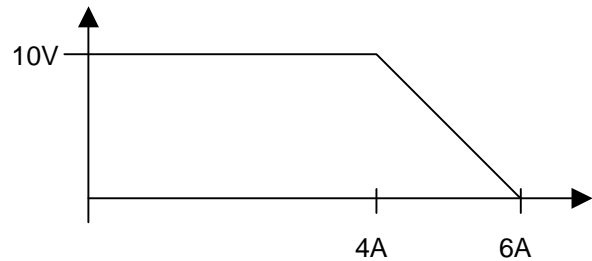
Aufgabe 1:

a) $0V \leq U_A \leq 20V$

b) $R_V = 40 \Omega$

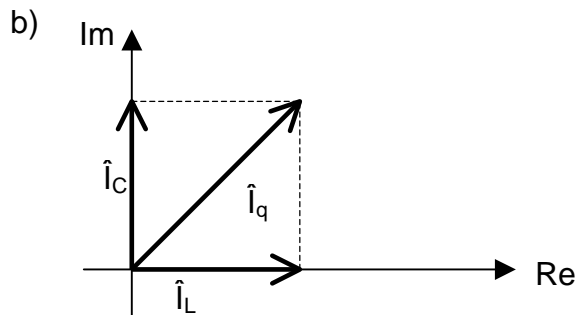
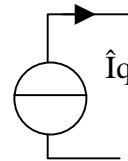
d) $U = -2,14V$

c)



Aufgabe 2:

a) $(I_K = I_L + I_C); \quad \hat{I}_q = 193,9 \text{ mA } e^{j45^\circ}$



d) $R = 72,94 \Omega$

Aufgabe 3:

a) $Q = Q(r_1) = 83,5 \text{ nC}; \quad Q(r_2) = -83,5 \text{ nC}; \quad Q(r_3) = 83,5 \text{ nC}; \quad Q(r_4) = -83,5 \text{ nC};$

b) $0 \leq r < r_1: D(r) = 0; \quad E(r) = 0; \quad \varphi(r) = 10 \text{ kV}$

$r_1 \leq r < r_2: D(r) = \frac{Q}{4\pi r^2}; \quad E(r) = \frac{Q}{4\pi r^2 \epsilon_0 \epsilon_{r1}}; \quad \varphi(r) = 2,5 \text{ kV} - \frac{Q}{4\pi \epsilon_1} \left(\frac{1}{r} - \frac{1}{r_2} \right)$

$r_2 \leq r < r_3: D(r) = 0; \quad E(r) = 0; \quad \varphi(r) = 2,5 \text{ kV}$

$r_3 \leq r < r_4: D(r) = \frac{Q}{4\pi r^2}; \quad E(r) = \frac{Q}{4\pi r^2 \epsilon_0 \epsilon_{r2}}; \quad \varphi(r) = 2,5 \text{ kV} - \frac{Q}{4\pi \epsilon_2} \left(\frac{1}{r} - \frac{1}{r_4} \right)$

Aufgabe 4:

a) $I = 1,671 \text{ A}; \quad \text{b) } S = 0,853 \text{ und } I = 2 \text{ A}; \quad v = 0,947 \text{ m/s}$