

Oppgave 1 (30/1/2025)

1. 5×10^{13} electrons.

$$\frac{1 \text{ C}}{6.25 \cdot 10^{18} \text{ electrons}}$$

$$= 8 \cdot 10^{13} \text{ C}$$

2. $80 \cdot 10^{16} \text{ C}$

$$\frac{6.25 \cdot 10^{12} \text{ elec}}{1 \text{ C}}$$

$$= 5 \cdot 10^{14} \text{ electrons}$$

3. a) $V = \frac{10 \text{ J}}{1 \text{ C}} = 10 \text{ V}$

b) $\frac{5 \text{ J}}{2 \text{ C}} = 2.5 \text{ V}$

c) $\frac{100 \text{ J}}{25 \text{ C}} = 4 \text{ V}$

4. $V = \frac{500 \text{ J}}{100 \text{ C}} = 5 \text{ V}$

5. a) $I = \frac{75 \text{ C}}{1 \text{ s}} = 75 \text{ A}$

b) $I = \frac{10 \text{ C}}{0.5 \text{ s}} = 20 \text{ A}$

c) $I = \frac{5 \text{ C}}{2 \text{ s}} = 2.5 \text{ A}$

a lot!

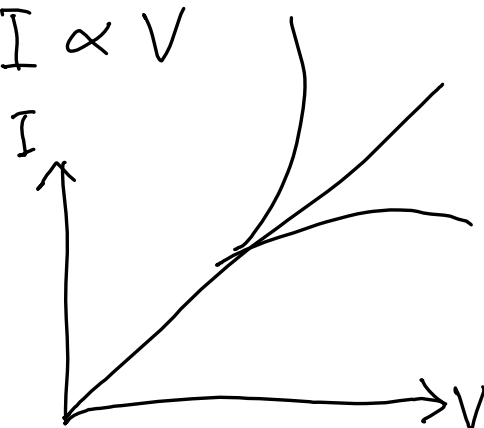
6. $I = \frac{Q}{t} \Rightarrow t = \frac{Q}{I} = \frac{10 \text{ C}}{5 \text{ A}} = 2 \text{ s}$

7. $R = \frac{V}{I} \rightarrow I = \frac{V}{R} \rightarrow I \propto V$

a) 3 A

b) 0.2 A

c) 1.5 A



8. a) $I = \frac{V}{R} = \frac{5 \text{ V}}{1 \Omega} = 5 \text{ A}$

b) $I = \frac{15 \text{ V}}{10 \Omega} = 1.5 \text{ A}$

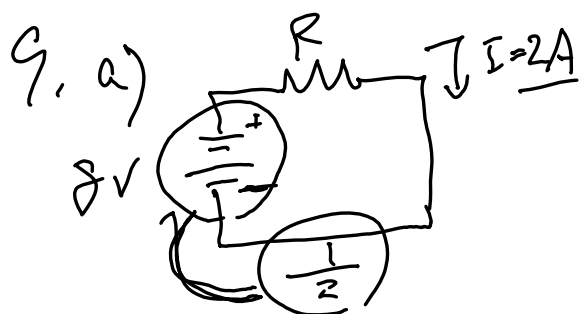
c) $\frac{80 \text{ V}}{100 \Omega} = 0.8 \text{ A}$

d) $\frac{30 \text{ V}}{15 \text{ k}\Omega} = 2 \text{ mA}$

e) $\frac{250 \text{ V}}{4.7 \text{ M}\Omega} = 53.2 \mu\text{A}$

$$\frac{1}{\text{k}} = \text{m}$$

$$\frac{1}{10^{-3}} = 10^3$$



$$R = \frac{V}{I} = \frac{8 \text{ V}}{2 \text{ A}} = 4 \Omega$$

b) $R = \frac{12 \text{ V}}{4 \text{ mA}} = 3 \text{ k}\Omega$

c) $R = \frac{3 \text{ kV}}{5 \mu\text{A}} = 0.2 \text{ M}\Omega = 200 \text{ k}\Omega$

Useful things:

n	μ	m	k	M	G
-9	-6	-3	3	6	9

1 C : charge of $6.25 \cdot 10^{18}$ electrons

$$I = \frac{Q}{t} \quad [1 \text{ A} = 1 \text{ C/s}]$$

$$V = \frac{W}{Q} \quad [1 \text{ V} = 1 \text{ J/C}]$$

$$R = \frac{V}{I} \quad [1 \Omega = 1 \text{ V/A}]$$

