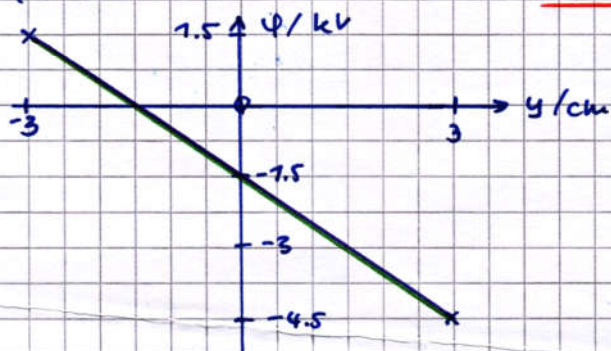


$$2.1 \quad U_{P_2 P_1} = \varphi(P_2) - \varphi(P_1) \Leftrightarrow \varphi(P_2) = U_{P_2 P_1} + \varphi(P_1)$$

$$\varphi(P_2) = 6,0 \text{ kV} - 4,5 \text{ kV} = \underline{1,5 \text{ kV}}$$

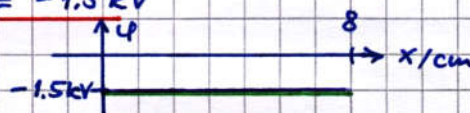


Im homogenen Feld:
Linearer Pot.-Verlauf

2.2 Aquipotentialflächen sind parallel zu den Platten.

\Rightarrow Für $y=0$ ist $\varphi(x) = \text{konst.}$, da in einer Aquipot.-fl.

$$\text{Aus 2.1: } \varphi(y=0) = \underline{\varphi(x) = -1,5 \text{ kV}}$$



$$2.3 \quad E = \frac{|U|}{d} = \frac{U_{P_2 P_1}}{d} = \frac{6,0 \text{ kV}}{0,060 \text{ m}} = \underline{1,0 \cdot 10^5 \frac{\text{V}}{\text{m}}}$$

Richtung parallel zur y-Achse; Orient. in Richtung abnehmendes Potential, also in pos. y-Richtung

2.4.1

$$y = \frac{1}{2} a t^2; \quad m a = F_{el} = q E (= q \cdot \frac{U}{d}) \Leftrightarrow a = \frac{q \cdot E}{m}$$

$$x = v_0 t \Leftrightarrow t = \frac{x}{v_0} = \frac{L}{v_0}$$

$$y = \frac{1}{2} \cdot \frac{q \cdot E}{m} \cdot \left(\frac{L}{v_0}\right)^2 = \frac{1}{2} \cdot \frac{1,6 \cdot 10^{-19} \text{ As} \cdot 1,0 \cdot 10^5 \frac{\text{V}}{\text{m}}}{1,673 \cdot 10^{-27} \text{ kg}} \cdot \left(\frac{0,080 \text{ m}}{1,1 \cdot 10^6 \frac{\text{m}}{\text{s}}}\right)^2$$

$$\underline{y = 2,5 \text{ cm}}$$

$$2.4.2 \quad v_y: \frac{1}{2} m v_y^2 = F_{el} \cdot y = q \cdot E \cdot y \Leftrightarrow v_y^2 = \frac{2 \cdot q E y}{m}$$

$$v^2 = v_x^2 + v_y^2 = v_0^2 + v_y^2 = v_0^2 + \frac{2 q E y}{m}$$

$$v_i = \left[\left(1,1 \cdot 10^6 \frac{\text{m}}{\text{s}}\right)^2 + \frac{2 \cdot 1,6 \cdot 10^{-19} \text{ As} \cdot 1,0 \cdot 10^5 \text{ V/m} \cdot 0,025 \text{ m}}{1,673 \cdot 10^{-27} \text{ kg}} \right]^{1/2}$$

$$= \underline{1,3 \cdot 10^6 \frac{\text{m}}{\text{s}}}$$