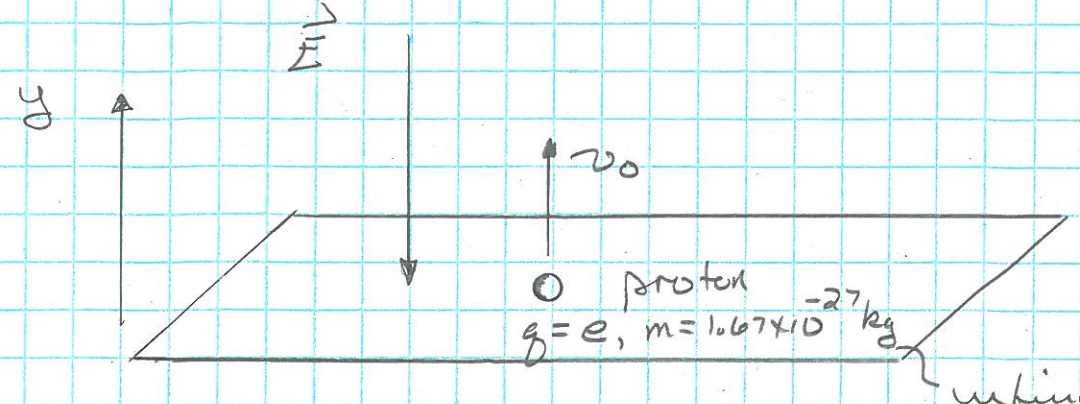
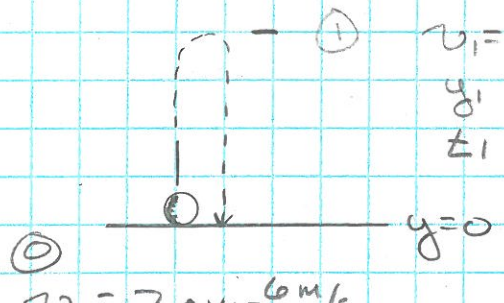


$$\vec{E} = \frac{\eta}{2\varepsilon_0}\hat{j} = -1.13 \times 10^5 \hat{j}\ \frac{N}{C}$$

For proton: $\vec{F} = m\vec{a} = q\vec{E}$ (ignore gravity)

$$\vec{a} = \frac{e}{m}\vec{E} = -1.082 \times 10^{13} \hat{j}\ m/s^2$$

Now, kinematics, $a_y = -1.082 \times 10^{13}\ m/s^2$



So: $v_1^2 = v_0^2 + 2a_y \Delta y$ $\quad \Delta y = y_1 - y_0$

$$0 = v_0^2 + 2a_y y_1$$

$$y_1 = \frac{-v_0^2}{2a_y} = 0.1848\ m$$

$$= \underline{18.48\ cm}$$