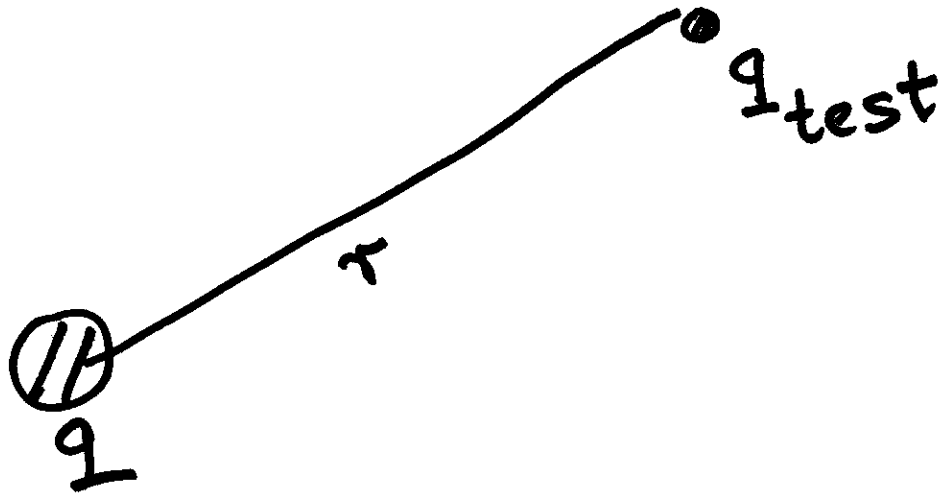


$$z = y \tan \theta \quad dz = y \sec^2 \theta d\theta$$

$$\begin{aligned} E_y &= \frac{\lambda}{4\pi\epsilon_0} \int_{-\infty}^{+\infty} \frac{y^2 \sec^2 \theta d\theta}{y^3 \sec^3 \theta} \\ &= \frac{\lambda}{4\pi\epsilon_0} \cdot \frac{1}{y} \int_{-\pi/2}^{+\pi/2} \cos \theta \cdot d\theta \\ &= \frac{\lambda}{2\pi\epsilon_0} \frac{1}{y} \end{aligned}$$



$$\frac{e^2}{c\hbar} = \frac{1}{137}.$$

