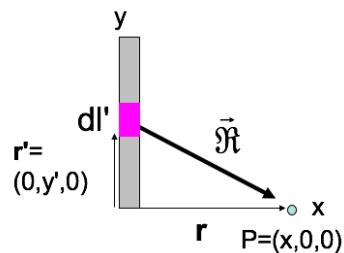


$$\mathbf{E}(\mathbf{r}) = \int \frac{\lambda dl'}{4\pi\epsilon_0 \mathcal{R}^3} \vec{\mathcal{R}}, \text{ so: } E_x(x, 0, 0) = \frac{\lambda}{4\pi\epsilon_0} \int \dots$$

- A. $\int \frac{dy'x}{x^3}$
- B. $\int \frac{dy'x}{(x^2 + y'^2)^{3/2}}$
- C. $\int \frac{dy'y'}{x^3}$
- D. $\int \frac{dy'y'}{(x^2 + y'^2)^{3/2}}$
- E. Something else



What do you expect to happen to the field as you get really far from the rod?

$$E_x = \frac{\lambda}{4\pi\epsilon_0} \frac{L}{x\sqrt{x^2 + L^2}}$$

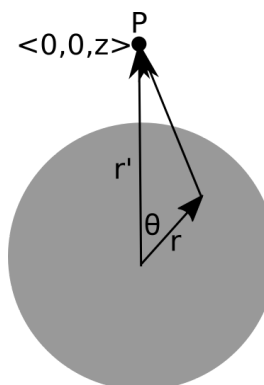
- A. E_x goes to 0.
- B. E_x begins to look like a point charge.
- C. E_x goes to ∞ .
- D. More than one of these is true.
- E. I can't tell what should happen to E_x .

Activity:

You determine that a particular electrostatics problem cannot be integrated analytically. How do you instruct a computer to do it for you?

Work with those around you to come up with a series of instructions (in plain words) to tell the computer to do it.

Given the location of the little bit of charge (dq), what is $|\vec{\mathcal{R}}|$?



- A. $\sqrt{z^2 + r'^2}$
- B. $\sqrt{z^2 + r'^2 - 2zr' \cos \theta}$
- C. $\sqrt{z^2 + r'^2 + 2zr' \cos \theta}$
- D. Something else