

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 .

ANNOUNCEMENTS

- If you need help with Python, let me know ASAP!
- Honors Option
 - Talk to me about your ideas
 - Option 1: Design a computational activity for this class
 - Option 2: Develop a computational model and paper for an interesting electrostatics phenomenon
 - Option 3: Pitch me your idea

Taylor Series?

- A. I remember those and am comfortable with them.
- B. I remember them, but it might take a little while to get comfortable.
- C. I've definitely worked with them before, but I don't recall them.
- D. I have never seen them.

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

If we are *far from the rod*, what is the small parameter in our Taylor expansion?

- A. x
- B. L
- C. x/L
- D. L/x
- E. More than one of these

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

If we are *very close* to the rod, what is the small parameter in our Taylor expansion?

- A. x
- B. L
- C. x/L
- D. L/x
- E. More than one of these

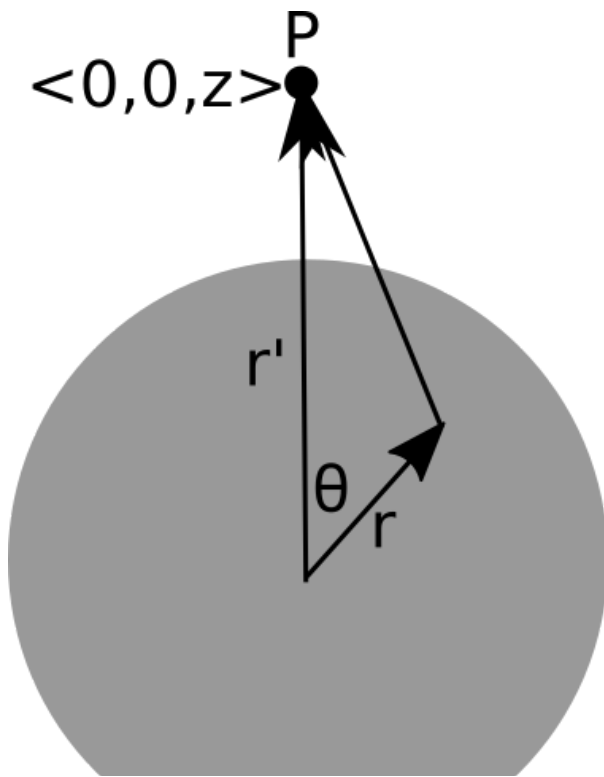
The model we developed for the motion of the charged particle near the charged disk (on the center axis) is represented by this *nonlinear* differential equation:

$$\ddot{x} = C \left[1 - \frac{1}{(x^2 + R^2)^{1/2}} \right]$$

You decide to expand this expression for small parameter is x/R , under what conditions is any solution appropriate?

- A. When the disk is very large
- B. When the disk is very small
- C. When the particle is far from the disk
- D. When the particle is near the disk
- E. More than one of these

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



- 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



Which of the following are vectors?

(I) Electric field, (II) Electric flux, and/or (III) Electric charge

A. I only

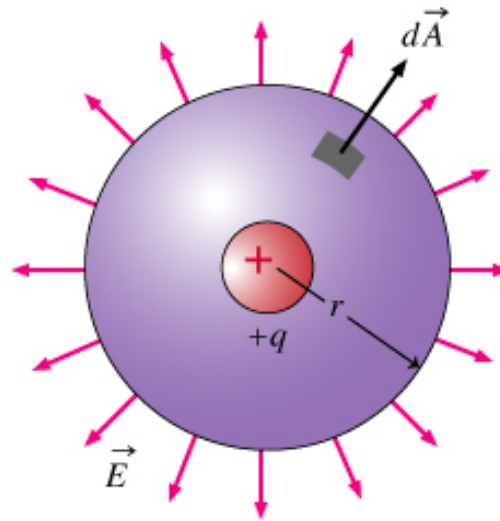
B. I and II only

C. I and III only

D. II and III only

E. I, II, and III

GAUSS' LAW



$$\oint_S \mathbf{E} \cdot d\mathbf{A} = \int_V \frac{\rho}{\epsilon_0} d\tau$$