

# Checkpoint 1

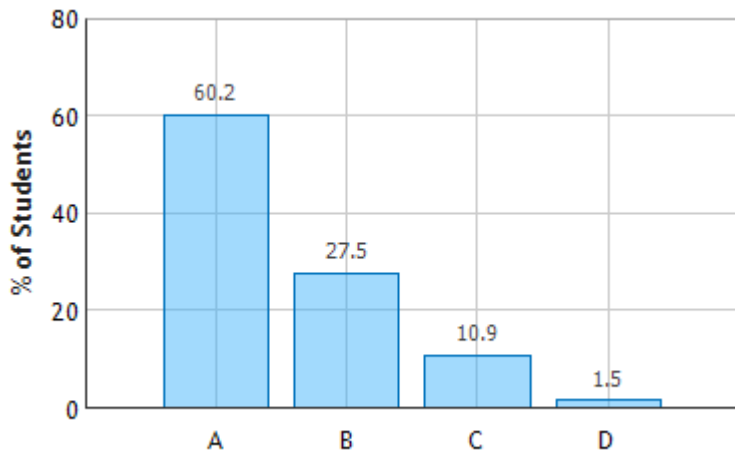
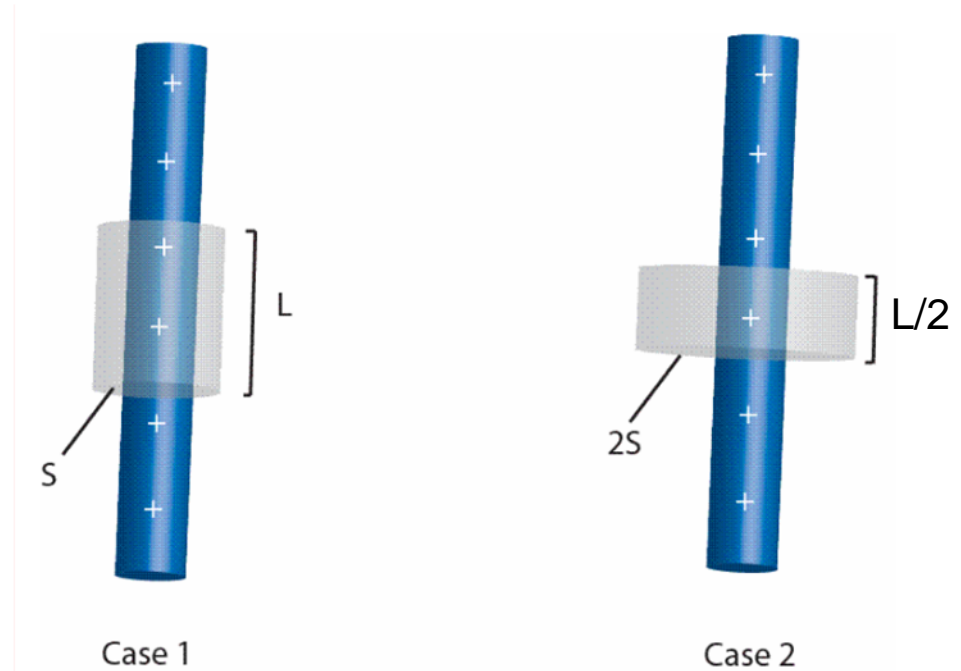


“Because the charge is proportional to length of the cylinder enclosing the charge, and the flux is proportional to the charge, this means that the flux is proportional to the length and an increase in length of  $2l$  yields in an increase in flux of  $2\omega$ .”

“The flux is just  $E \cdot A$ , and the area is  $2(\pi)RL$ , so in both cases the flux is  $(\lambda)(s)(L)/(\epsilon_0)$ . The fluxes are the same.”

“The first cylinder has double the area, and double the charge so the flux should be quadrupled.”

An infinitely long charged rod has uniform charge density  $\lambda$  and passes through a cylinder (gray). The cylinder in Case 2 has twice the radius and half the length compared with the cylinder in Case 1.



- $\Phi_1 = 2\Phi_2$   
(A)
- $\Phi_1 = \Phi_2$   
(B)
- $\Phi_1 = 1/2\Phi_2$   
(C)
- none  
(D)