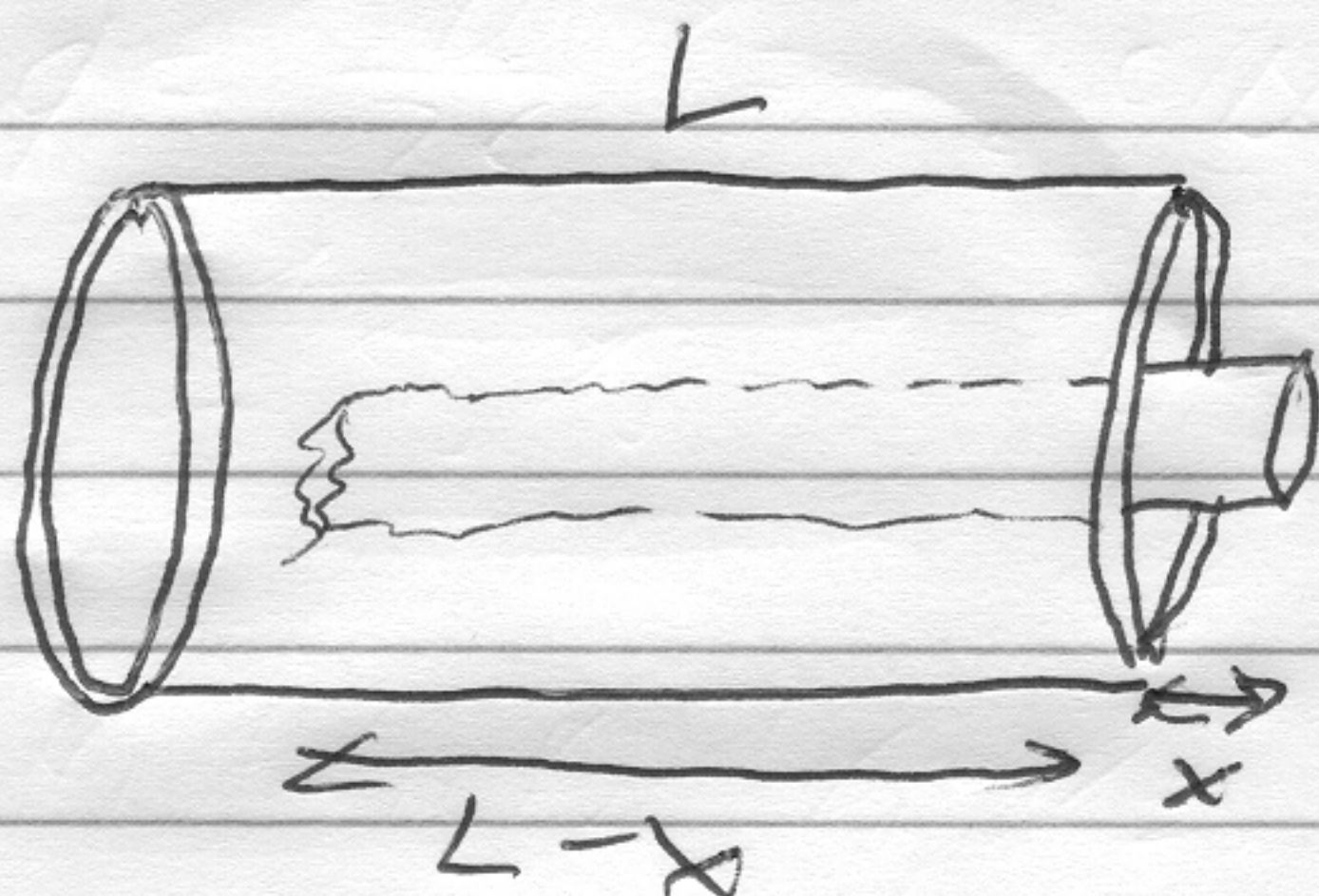


7-19



$$C = \frac{2\pi\epsilon_0(L-x)}{\ln(b/a)}$$

$\Delta\phi$ constant

$$\text{so } F = \frac{dU_e}{dx}$$

$$U_e = \frac{1}{2} C (\Delta\phi)^2 = \frac{\pi\epsilon_0(L-x)(\Delta\phi)^2}{\ln(b/a)}$$

$$F = \left. \frac{dU_e}{dx} \right|_{\Delta\phi} = - \frac{\pi\epsilon_0(\Delta\phi)^2}{\ln(b/a)}$$

- Sign means restoring force.