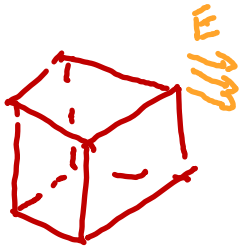
$\int_1 E\,dA \cdot \int_2 E\,dA$

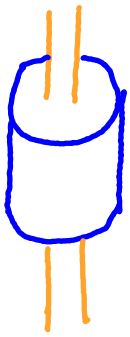


Flux = 0

Gauss' Law

k_e = coulomb constant = $8.99 \times 10^9 \frac{N}{}$

$$E = \frac{k_e q}{r^2}$$



$$E = 2k_e \frac{\lambda}{r}$$

Uniformly charged disk problem

- lies in xy plane
- center at origin

$r = 45\,cm$ $\quad \sigma = 8.8 \times 10^{-3}\ C/m^2$

$z_1 = 5cm$ $\quad z_2 = 10cm$ $\quad z_3 = 200cm$

$$E = 2\pi k_e \sigma \left(1 - \frac{z}{\sqrt{z^2+r^2}}\right)$$

$$E = 4.97 \times 10^8 \left(1 - \frac{z}{\sqrt{z^2+2025}}\right)$$

$E_1 = 4.42 \times 10^8$

$E_2 = 3.89 \times 10^8$

$E_3 = 1.21 \times 10^7$

Ch 22 prob 19