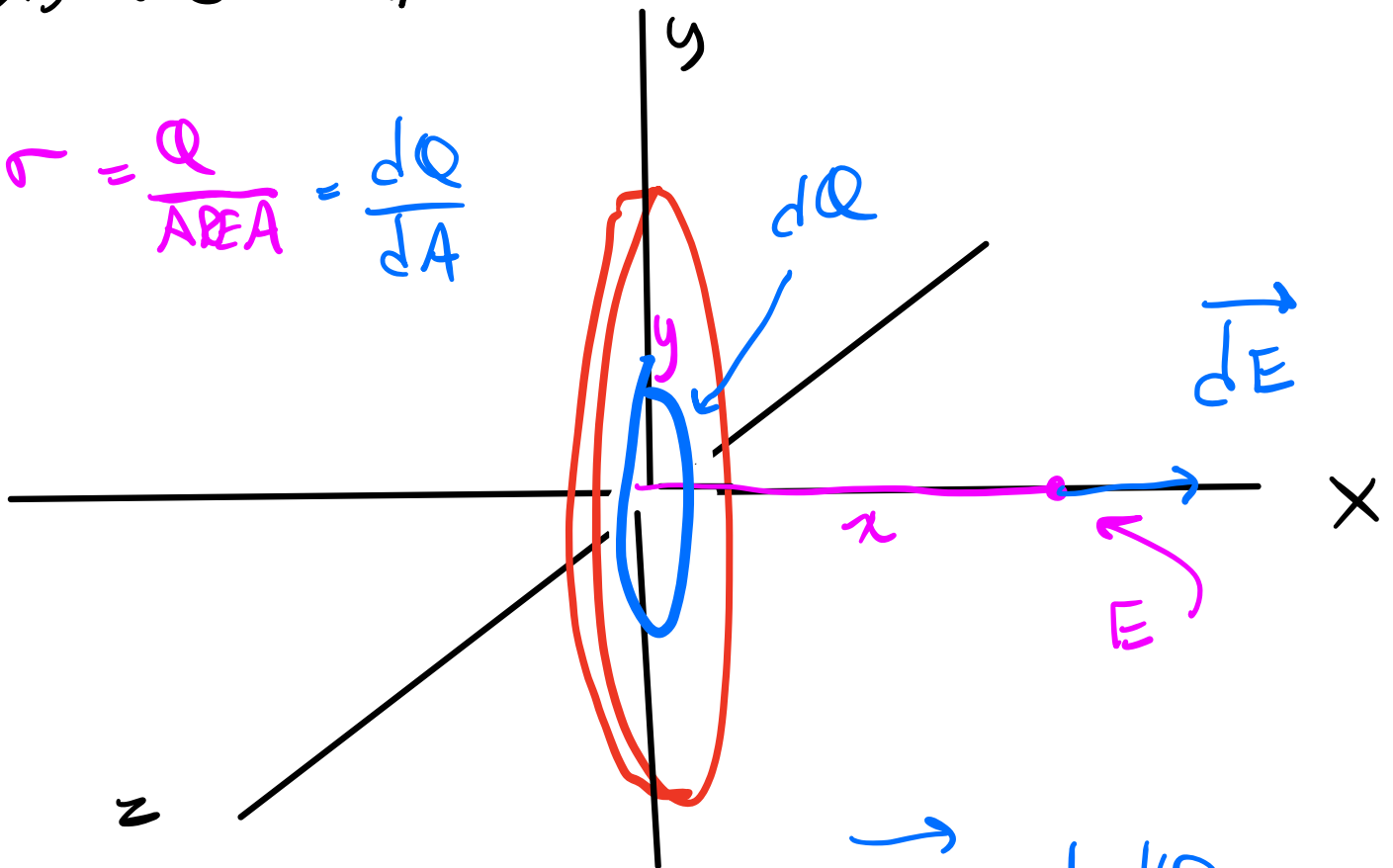


$$\Sigma E = \frac{kQx}{(x^2+y^2)^{3/2}}$$

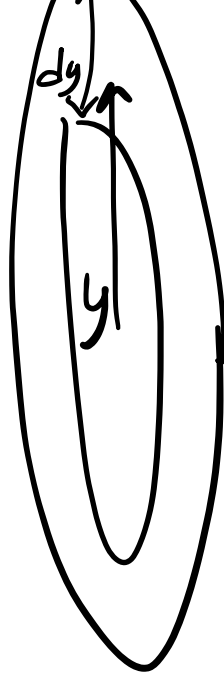
DISK OF CHARGE

$$\sigma = \frac{Q}{\text{AREA}} = \frac{dQ}{dA}$$



IF  $E = \frac{kQx}{(x^2+y^2)^{3/2}}$  THEN  $dE = \frac{k dQ x}{(x^2+y^2)^{3/2}}$

$$dQ = \sigma dA = \sigma 2\pi y dy$$



$$E = \int dE = \int \frac{k\sigma 2\pi y dy x}{(x^2 + y^2)^{3/2}}$$

$$E = k\sigma\pi x \int \frac{zy dy}{(x^2 + y^2)^{3/2}}$$

★

$$U = x^2 + y^2$$

$$dU = 2y dy$$

★

$$\int U^{-3/2} dU$$

$$E = \star \left[ -2U^{-\frac{1}{2}} \right]$$

$$E = \star \left[ -2(x^2 + y^2)^{-\frac{1}{2}} \right] \begin{pmatrix} y \\ 0 \end{pmatrix}$$

$$E = \star \left[ -2(x^2 + y^2)^{-\frac{1}{2}} - -2(x^2 + 0^2)^{-\frac{1}{2}} \right]$$

$$E = \star \left[ \frac{2}{x} - \frac{2}{(x^2 + y^2)^{\frac{1}{2}}} \right]$$

$$E = 2k\sigma\pi\chi \left[ \frac{1}{\chi} - \frac{1}{(x^2 + y^2)^{\frac{1}{2}}} \right]$$

$$E = 2K\sigma\pi \left[ 1 - \frac{x}{(x^2+y^2)^{\frac{1}{2}}} \right]$$

$$\frac{2\sigma\pi}{24\pi\epsilon_0}$$

$$= \frac{\sigma}{2\epsilon_0} \left[ 1 - \frac{x}{(x^2+y^2)^{\frac{1}{2}}} \right]$$

DONE