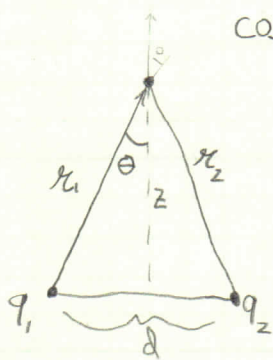


2 Ex 1



$$\cos\theta = \frac{2z}{\sqrt{4z^2 + d^2}} \quad \sin\theta = \frac{d}{\sqrt{4z^2 + d^2}}$$

$$\hat{r}_1 = \frac{d}{2} \hat{x} + z \hat{z} \quad \hat{r}_1 = \frac{d}{\sqrt{4z^2 + d^2}} \hat{x} + \frac{2z}{\sqrt{4z^2 + d^2}} \hat{z}$$

$$\hat{r}_2 = -\frac{d}{2} \hat{x} + z \hat{z} \quad \hat{r}_2 = -\frac{d}{\sqrt{4z^2 + d^2}} \hat{x} + \frac{2z}{\sqrt{4z^2 + d^2}} \hat{z}$$

$$|\hat{r}_1| = |\hat{r}_2| = \frac{1}{2} \sqrt{4z^2 + d^2}$$

$$E = k \left(q_1 \left[\frac{4d}{(4z^2 + d^2)^{3/2}} \hat{x} + \frac{8z}{(4z^2 + d^2)^{3/2}} \hat{z} \right] + q_2 \left[\frac{4d}{(4z^2 + d^2)^{3/2}} \hat{x} + \frac{8z}{(4z^2 + d^2)^{3/2}} \hat{z} \right] \right)$$

$$\text{w/ } q_1 = q_2$$

$$E = kq \frac{16z}{(4z^2 + d^2)^{3/2}} \hat{z}$$