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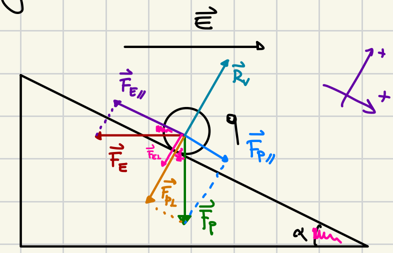

$\alpha = \frac{\pi}{6} = 30°$

$m = 3{,}15 \cdot 10^{-3}\,kg$ $\qquad q = ?$

$E = 4{,}45 \cdot 10^{4}\,\frac{N}{C}$

La sferetta è ferma.

Dato che la sfera è ferma $\vec{F}_p + \vec{F}_E + \vec{R}_v = 0$

Guardo soltanto // : $\vec{F}_{P//} + \vec{F}_{E//} = 0$

La carica q deve essere negativa per permettere l'equilibrio

$F_{P//} - F_{E//} = 0$

$F_p \cdot \sin\alpha - F_E \cdot \cos\alpha = 0$ $\qquad F_E = E \cdot |q|$ $\qquad \vec{E} = \frac{\vec{F}}{q}$

$mg\sin\alpha = E \cdot |q| \cdot \cos\alpha$

$\rightsquigarrow \quad |q| = \frac{mg}{E} \cdot tg\,\alpha \approx 4 \cdot 10^{-7}\,C$

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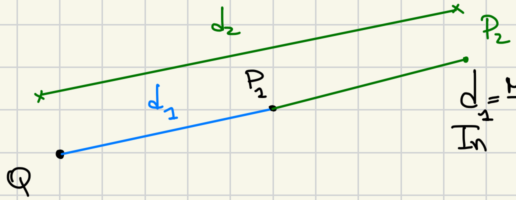

$d_1 = 7{,}1\,m$

In P_1 c'è un campo elettrico $\vec{E}$.

Calcolare di quanto deve aumentare d_1 (cioè $d_2 - d_1$) affinché

$$E(P_2) = E_2 = \frac{75}{100} E_1 = \frac{75}{100} E(P_1)$$

$$E_1 - \frac{25}{100} E_1 = \frac{100-25}{100} E_1$$

$$E_1 = k_0 \frac{Q}{d_1^2} \qquad E_2 = k_0 \frac{Q}{d_2^2}$$

$$E_2 = \frac{3}{4} E_1 \rightsquigarrow \cancel{k_0} \frac{\cancel{Q}}{d_2^2} = \frac{3}{4} \cancel{k_0} \frac{\cancel{Q}}{d_1^2}$$

$$4 d_1^2 = 3 d_2^2 \rightsquigarrow d_2^2 = \frac{4}{3} d_1^2 \rightsquigarrow d_2 = d_1 \frac{2\sqrt{3}}{3}$$

$$\rightsquigarrow d_2 - d_1 = \frac{2\sqrt{3}}{3} d_1 - d_1 = \left(\frac{2\sqrt{3}}{3} - 1\right) d_1 = \left(\frac{2\sqrt{3} - 3}{3}\right) d_1 \simeq 1{,}1\ m$$