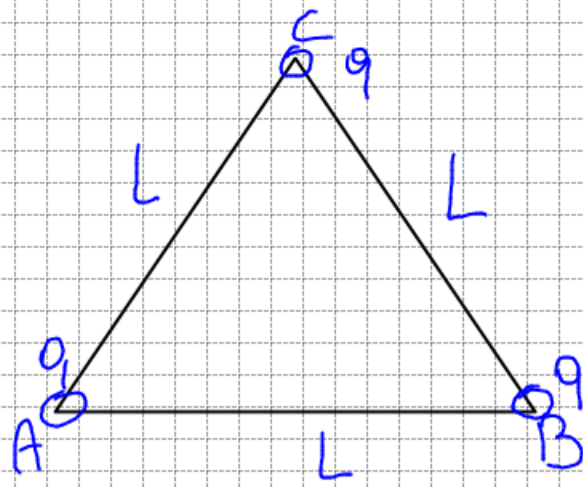


PROBLEMA 1



$$1) U = U_{AB} + U_{BC} + U_{AC} = 3K_0 \frac{q^2}{L}$$

$$2) Q = 2q \quad U' = \frac{3K_0 (4q^2)}{L} = 4U$$

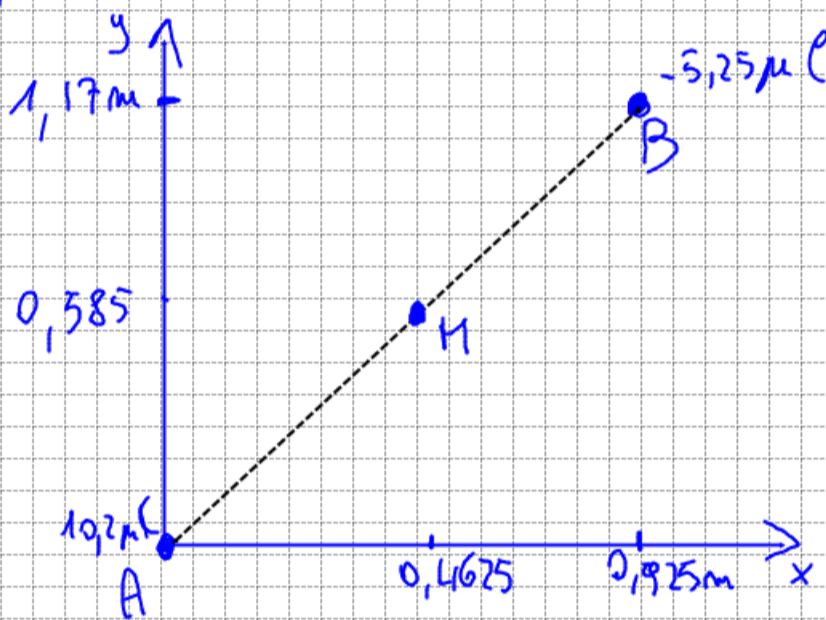
$$3) Q_A = 2q \quad Q_B = \frac{q}{2} \quad Q_C = q$$

$$U_2 = U_{AB} + U_{AC} + U_{BC} = \frac{K_0}{L} \left[2q \cdot \frac{q}{2} + 2q \cdot q + \frac{q}{2} \cdot q \right] = \frac{5}{2} \frac{K_0 q^2}{L}$$

PROBLEMA 2

Una carica di $10,2 \mu\text{C}$ fissa nell'origine.

Se una carica di $-5,25 \mu\text{C}$ con massa di $3,20 \text{g}$ è lasciata libera da ferma nel punto $(0,925 \text{m}; 1,17 \text{m})$, calcola la velocità quando è a metà strada dall'origine degli assi.



$$F_{AB} = K_0 \frac{q_A q_B}{AB^2} \quad F_{AB} = 8,99 \times 10^9 \frac{\text{N} \cdot \text{m}^2}{\text{C}^2} \cdot \frac{10,2 \mu\text{C} \times (-5,25 \mu\text{C})}{(0,925^2 + 1,17^2) \text{m}^2}$$

$$F_{AB} = -128,53 \cdot 10^{-3} \text{N}$$

$$F_{AB} = -0,13 \text{N}$$

$$\frac{481,4145}{3,745625} \\ AB = \sqrt{3,745625 \text{m}^2} = 1,94 \text{m}$$

$$U_{P_i} + E_{C_i} = U_{P_f} + E_{C_f}$$

$$K_0 \frac{q_A q_B}{AB} = K_0 \frac{q_A q_B}{AB} + \frac{1}{2} m v_f^2$$

$$- \frac{K_0 q_A q_B}{AB} = \frac{1}{2} m v_f^2$$

$$v_f = \sqrt{\frac{-2K_0 q_A q_B}{m AB}}$$

$$= \sqrt{\frac{-2 \times 8,99 \times 10^9 \times 10,2 \times (-5,25)}{3,20 \times 10^{-3} \times 1,94}}$$

$$= \sqrt{155,09 \times 10^{12}} = 12,5 \times 10^6 \frac{\text{m}}{\text{s}}$$