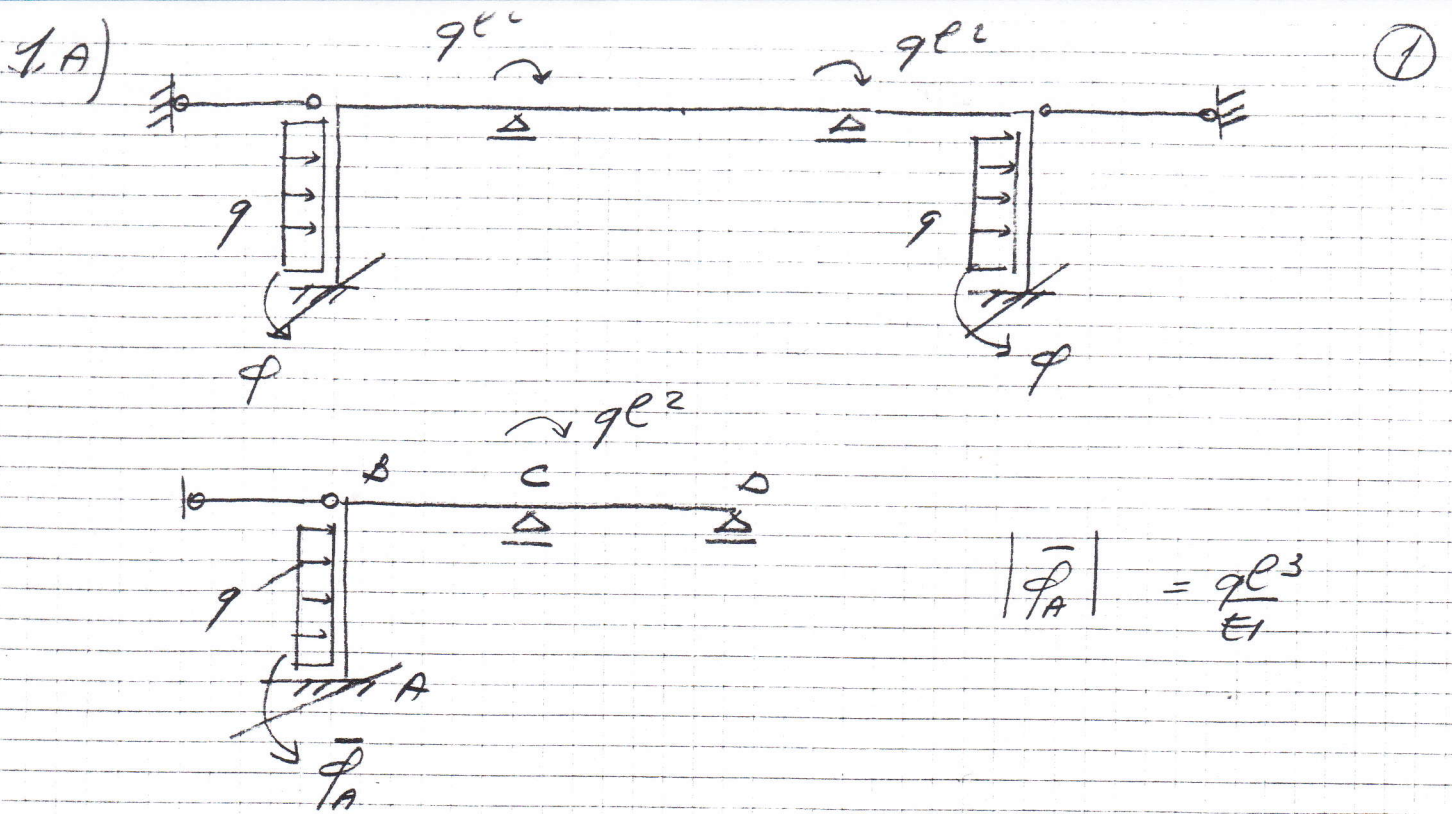




$$M_{BA}^0 = -\frac{ql^2}{12} + \frac{2EI}{l} \bar{\phi}_A$$

$$M_{CB}^0 = 0$$

$$M_{BC}^0 = 0$$

$$M_{CD}^0 = 0$$

$$M_{DA} = \frac{4EI}{l} \phi_B$$

$$M_{CB} = \frac{4EI}{l} \phi_C + \frac{2EI}{l} \phi_B$$

$$M_{BC} = \frac{4EI}{l} \phi_B + \frac{2EI}{l} \phi_C$$

$$M_{CD} = \frac{3EI}{l} \phi_C$$

Free-body diagram of the second span (B-C) showing moments and loads:

- At support B: Moment $M_{BA}^0 = -\frac{ql^2}{12} + \frac{2EI}{l} \bar{\phi}_A$ (counter-clockwise), Reaction $\frac{4EI}{l} \phi_B$ (clockwise).
- At support C: Moment $M_{CB} = \frac{4EI}{l} \phi_C + \frac{2EI}{l} \phi_B$ (clockwise), Reaction $\frac{3EI}{l} \phi_C$ (counter-clockwise).
- Point load ql^2 at the center of the span (clockwise).

Sum of moments about B is zero:

$$\sum M_B = 0$$

$$\frac{ql^2}{12} - \frac{8EI}{l} \phi_B - \frac{2EI}{l} \cdot \frac{ql^3}{EI} - \frac{2EI}{l} \phi_C =$$

$$= -\frac{23}{12} ql^2 + \frac{8EI}{l} \phi_B + \frac{2EI}{l} \phi_C = 0$$

*