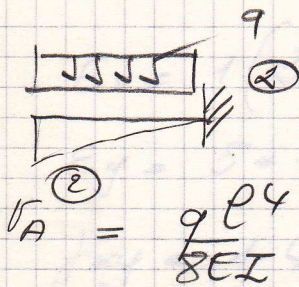


$$\begin{aligned} \phi_B^{(1)} &= \frac{q \cdot (2l)^3}{3EI} + \frac{q l^2 (2l)^2}{2 \cdot 2EI} = \frac{8 q l^4}{3EI} + \frac{q l^4}{EI} = \\ &= \frac{11 q l^4}{3EI} \end{aligned}$$

$$\phi_B^{(2)} = \frac{q l (2l)^2}{2EI} + \frac{q l^2 (2l)}{2 EI} = \frac{2 q l^3}{EI} + \frac{q l^3}{EI} = \frac{3 q l^3}{EI}$$

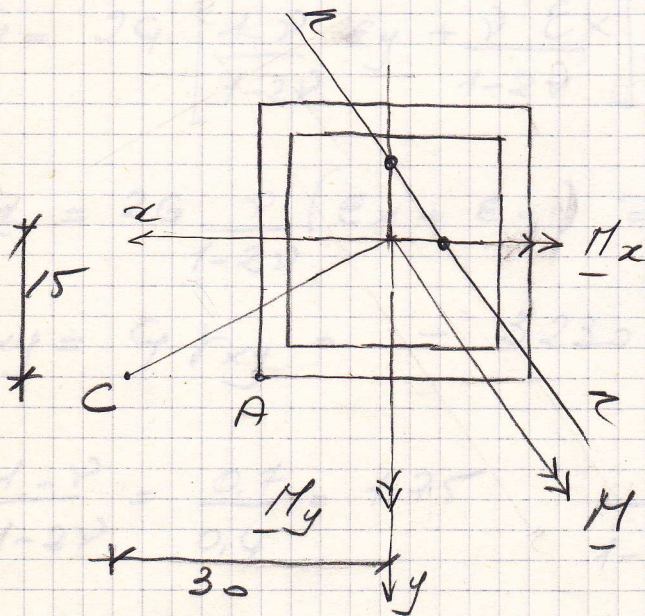


$$\phi_A^{tot} = \frac{q l^4}{8EI} + \frac{11 q l^4}{3 EI} + \frac{3 q l^4}{EI} =$$

$$= \frac{163 q l^4}{24 EI} = \phi_A$$

3)  $A = 30^2 - 29^2 = 59 \text{ cm}^2$

$$I_x = I_y = \frac{30^4}{12} - \frac{29^4}{12} = 8560 \text{ cm}^4$$



$$\begin{aligned} M_x &= -20.000 \cdot 15 = \\ &= -300000 \text{ kg cm} \end{aligned}$$

$$\begin{aligned} M_y &= 20.000 \cdot 30 = \\ &= 600.000 \text{ kg cm} \end{aligned}$$

$$\sigma_z = \frac{N}{A} + \frac{M_x y}{I} - \frac{M_y x}{I} =$$