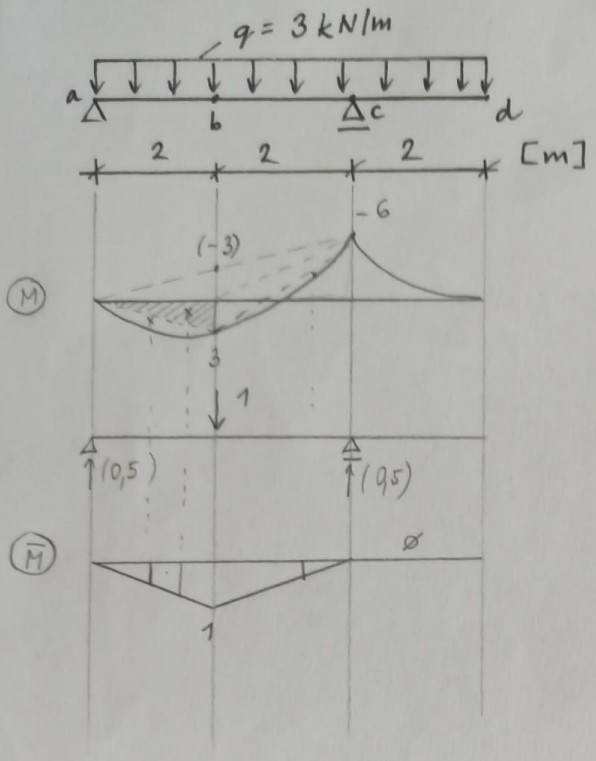


$w_b = ?$

$E = 30\ GPa$

$I = 4{,}5 \cdot 10^{-4}\ m^4$

$\bar{M}$ není monotonní na intervalu $\langle 0;4 \rangle \Rightarrow$ je nutno dělit na $\langle 0;2 \rangle$ a $\langle 2;4 \rangle$

$$w_b = \frac{1}{EI} \int M\bar{M}\,dx =$$

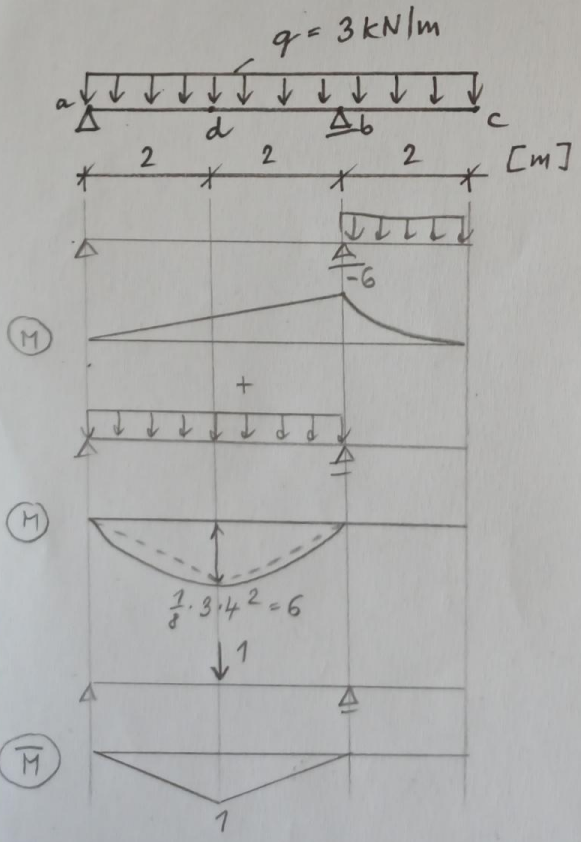
$$= \frac{1}{EI} \left\{ \left(\tfrac{1}{2} \cdot 3 \cdot 2\right) \cdot \left[\tfrac{2}{3} \cdot 1\right] + \left(\tfrac{2}{3} \cdot \tfrac{1}{8} \cdot 3 \cdot 2^2 \cdot 2\right) \cdot \left[\tfrac{1}{2}\right] \right.$$

$$+ \left(\tfrac{1}{2} \cdot (-6) \cdot 2\right) \left[\tfrac{1}{3} \cdot 1\right] + \left(\tfrac{1}{2} \cdot 3 \cdot 2\right) \cdot \left[\tfrac{2}{3} \cdot 2\right]$$

$$\left. + \left(\tfrac{2}{3} \cdot \tfrac{1}{8} \cdot 3 \cdot 2^2 \cdot 2\right) \cdot \left[\tfrac{1}{2} \cdot 1\right] \right\}^2 = \frac{4}{EI}$$

$$w_b = \frac{4}{30 \cdot 10^6 \cdot 4{,}5 \cdot 10^{-4}} = 2{,}96 \cdot 10^{-4}\ m$$

NEBO SUPERPOZICÍ (M)



$w_d = ?$

$E = 20\ GPa$

$I = 6{,}75 \cdot 10^{-4}\ m^4$

$$w_d = \frac{1}{EI} \int M\bar{M}\,dx =$$

$$= \frac{1}{EI} \left\{ \left(\tfrac{1}{2} \cdot 1 \cdot 4\right) \cdot \left[\tfrac{1}{2} \cdot (-6)\right] + \right.$$

$$\left(\tfrac{1}{2} \cdot 6 \cdot 2\right) \cdot \left[\tfrac{2}{3} \cdot 1\right] \cdot 2 +$$

$$\left. \left(\tfrac{2}{3} \cdot \tfrac{1}{8} \cdot 3 \cdot 2^2 \cdot 2\right) \left[\tfrac{1}{2} \cdot 1\right] \cdot 2 \right\} = \frac{4}{EI}$$

$$w_d = \frac{4}{20 \cdot 10^6 \cdot 6{,}75 \cdot 10^{-4}} = 2{,}96 \cdot 10^{-4}\ m$$