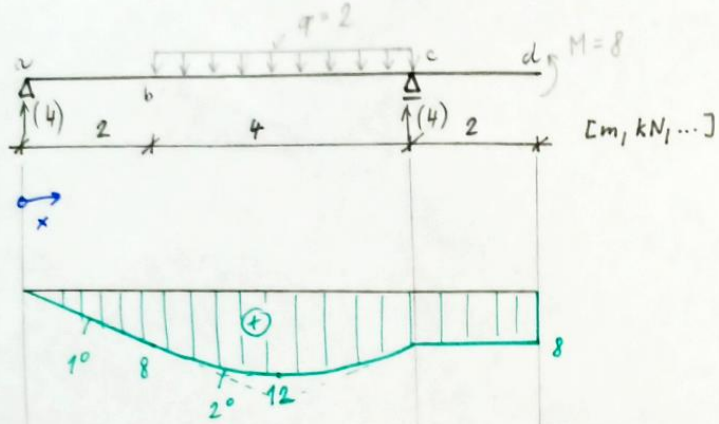
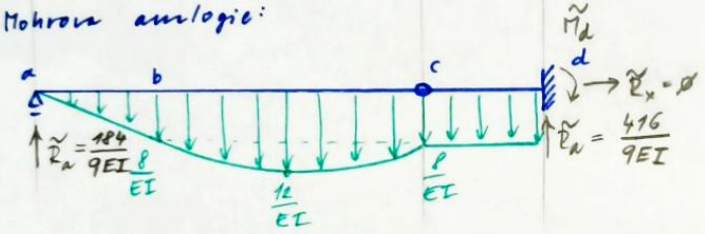
Určete w_b a φ_d $\quad EI = 4000\ kPa \cdot m^4$



Mohrova analogie:



$$w_b = \tilde{M}_b = \tilde{R}_a \cdot 2 - \frac{1}{2} \cdot 2 \cdot \frac{8}{EI} \cdot \frac{1}{3} \cdot 2 = \frac{184}{9EI} \cdot 2 - \frac{16}{3EI} = \frac{320}{9EI} = 8{,}\bar{8} \cdot 10^{-3}\ m$$

$$\varphi_d = \tilde{V}_d = -\tilde{R}_d = -\frac{416}{9EI} = -0{,}0\bar{1}1\bar{5}\ rad$$

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elcbrchova metoda:

$$M(x) = 4 \cdot x \Big|_{x>2} - 2 \cdot \frac{(x-2)^2}{2} \Big|_{x>6} + 4(x-6) + 2 \cdot \frac{(x-6)^2}{2}$$

$$\varphi(x) = -\frac{1}{EI}\left[C_1 + 4\frac{x^2}{2} \Big|_{x>2} - 2\frac{(x-2)^3}{6} \Big|_{x>6} + 4\frac{(x-6)^2}{2} + 2\frac{(x-6)^3}{6} \right]$$

$$w(x) = -\frac{1}{EI}\left[C_2 + C_1 x + 4\frac{x^3}{6} \Big|_{x>2} - 2\frac{(x-2)^4}{24} \Big|_{x>6} + 4\frac{(x-6)^3}{6} + 2\frac{(x-6)^4}{24} \right]$$

okrajové podmínky:

$w_a = w(x=0) = 0 \rightarrow \quad C_2 = 0$

$w_c = w(x=6) = 0 \rightarrow \quad C_1 \cdot 6 + 4 \cdot \frac{6^3}{6} - 2\frac{(6-2)^4}{24} = 0$

$$C_1 = -\frac{184}{9}$$

$$w_b = w(x=2) = -\frac{1}{EI}\left[-\frac{184}{9} \cdot 2 + 4 \cdot \frac{2^3}{6} \right] = \frac{320}{9EI} = 8{,}\bar{8} \cdot 10^{-3}\ m$$

$$\varphi_d = \varphi(x=8) = -\frac{1}{EI}\left[-\frac{184}{9} + 4 \cdot \frac{8^2}{2} - 2 \cdot \frac{6^3}{6} + 4 \cdot \frac{2^2}{2} + 2 \cdot \frac{2^3}{6} \right] =$$

$$= -\frac{416}{9EI} = -0{,}0\bar{1}1\bar{5}\ rad$$