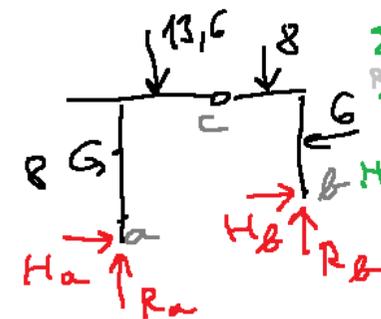
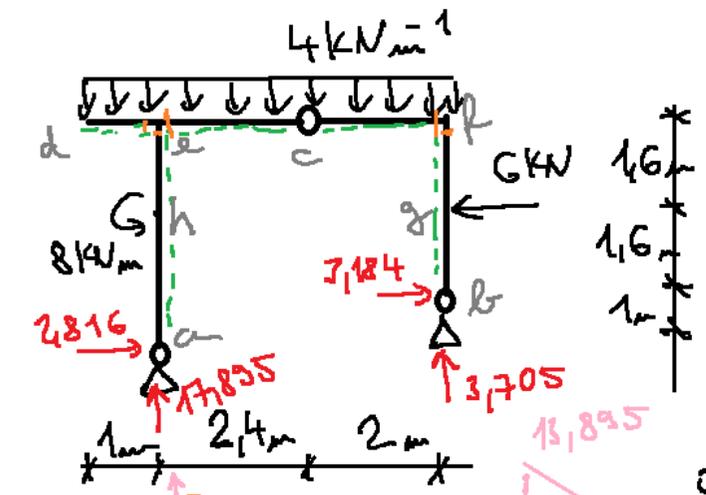


ZÁKLADY STAVEBNÍ MECHANIKY

BDA001

Trojkloubový lomený nosník s táhlem a bez táhla, reakce a diagramy vnitřních sil a momentů.

Zdeněk Kala



$$\sum M_a = 0 \quad 8 - 13,6 \cdot 0,7 - 8 \cdot 3,4 + 6 \cdot 2,6 - H_b \cdot 1 + R_b \cdot 4,4 = 0$$

$$\sum M_c = 0 \quad R_b \cdot 2 + H_b \cdot 3,2 - 6 \cdot 1,6 - 8 \cdot 1 = 0$$

$$H_b = 3,184 \leftarrow -H_b + 4,4 \cdot R_b = 13,12 \quad | \cdot 3,2$$

$$3,2 \cdot H_b + 2 \cdot R_b = 17,6$$

$$0 + 16,08 \cdot R_b = 59,58 \quad | : 17,12 \cdot 3,2 + 17,6$$

$$R_b = 3,705 \text{ kN}$$

$$\sum M_b = 0 \quad 1,6 + 8 \cdot 1 + 13,6 \cdot 3,7 + 8 + H_a \cdot 1 - R_a \cdot 4,4 = 0$$

$$\sum M_c = 0 \quad 13,6 \cdot 1,7 + 8 + H_a \cdot 4,2 - R_a \cdot 2,4 = 0 \quad (\oplus)$$

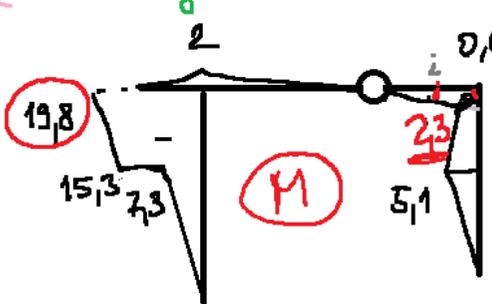
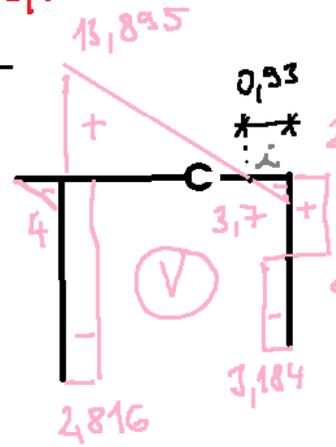
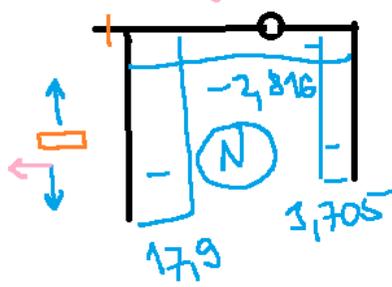
$$H_a = 2,816 \text{ kN} \leftarrow H_a - 4,4 \cdot R_a = -75,92 \quad | \cdot (-4,2)$$

$$4,2 \cdot H_a - 2,4 \cdot R_a = 31,12$$

$$0 + 16,08 \cdot R_a = 287,744 \Rightarrow R_a = 17,895$$

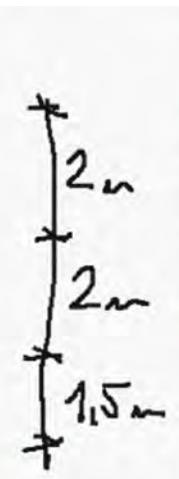
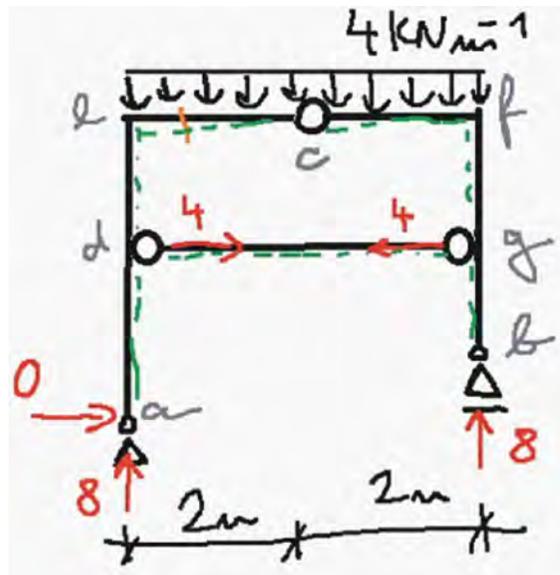
$$\sum F_x = 0 \quad 2,816 - 6 + 3,184 = 0 \quad \checkmark$$

$$\sum F_y = 0 \quad 17,895 - 17,6 - 8 + 3,705 = 0 \quad \checkmark$$



$$M_i = 3,705 \cdot 0,93 + 3,184 \cdot 3,2 - 6 \cdot 1,6$$

$$- 4 \cdot 0,93 \cdot \frac{0,93}{2} = + 2,3 \text{ kNm}$$



$$\begin{aligned} \Sigma F_x = 0 & \quad H_a = 0 \\ \Sigma M_a = 0 & \quad -4 \cdot 4 \cdot 2 + R_b \cdot 4 = 0 \\ \Sigma M_b = 0 & \quad -R_a \cdot 4 + 4 \cdot 4 \cdot 2 = 0 \\ \Sigma F_y = 0 & \quad 8 - 4 \cdot 4 + 8 = 0 \quad \checkmark \\ \Sigma M_c = 0 & \quad 4 \cdot 2 \cdot 1 - 8 \cdot 2 + H_f \cdot 2 = 0 \end{aligned}$$

