

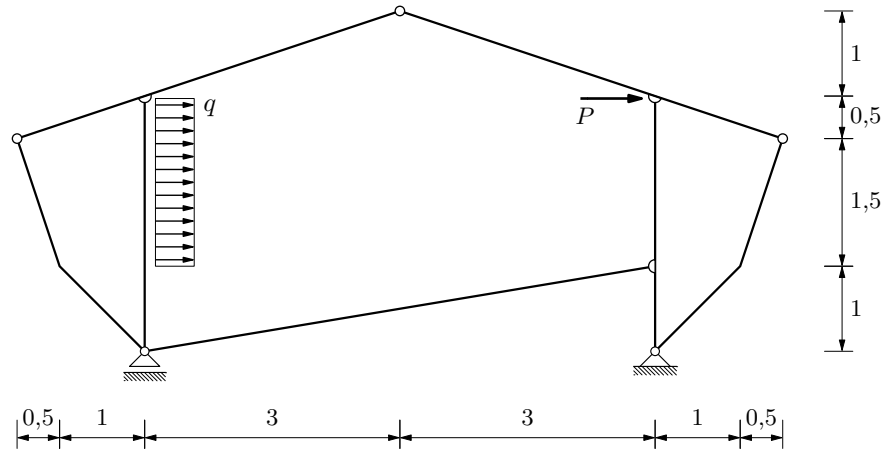
GS 1. — 1. kolokvij (A) (2023./2024.)

Zadatak 2.

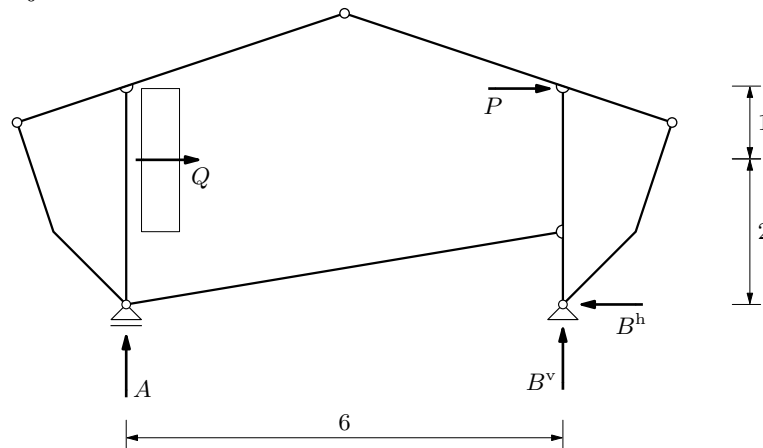
Izračunajte potrebne vrijednosti i nacrtajte dijagram momenata savijanja! Na temelju diferencijalnoga odnosa nacrtajte dijagram poprečnih sila!

$$q = 25 \text{ kN/m}$$

$$P = 75 \text{ kN}$$



vrijednosti reakcija:



$$Q = q \cdot 2 = 50 \text{ kN}$$

$$\sum_{\widehat{AB}} F_x = 0 : Q + P - B^h = 0 \quad \Rightarrow \quad B^h = Q + P = 125 \text{ kN}$$

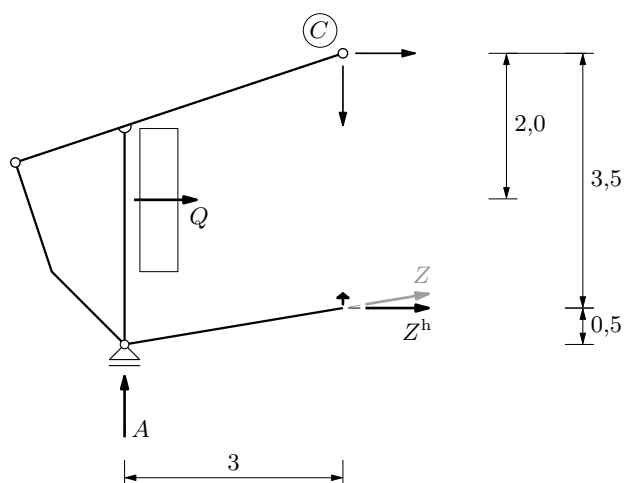
$$\sum_{\widehat{AB}} M_{/B} = 0 : -6 \cdot A - 2 \cdot Q - 3 \cdot P = 0$$

$$\Rightarrow A = -\frac{1}{3} \cdot Q - \frac{1}{2} \cdot P = -54,1667 \text{ kN}$$

$$\sum_{\widehat{AB}} M_{/A} = 0 : -2 \cdot Q - 3 \cdot P + 6 \cdot B^v = 0$$

$$\Rightarrow B^v = \frac{1}{3} \cdot Q + \frac{1}{2} \cdot P = 54,1667 \text{ kN}$$

vrijednost sile u zategi:

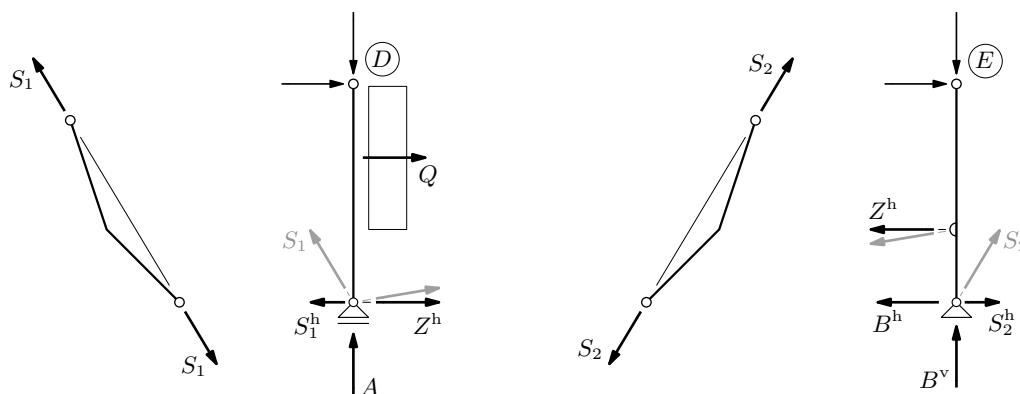


$$\sum_{\widehat{AC}} M_{/C} = 0 : \quad -3 \cdot A + 2 \cdot Q + 3,5 \cdot Z^h = 0$$

$$\Rightarrow \quad Z^h = \frac{6}{7} \cdot A - \frac{4}{7} \cdot Q = \frac{6}{7} \cdot (-54,1667) - \frac{4}{7} \cdot 50 = -75 \text{ kN}$$

$$\frac{Z}{Z^h} = \frac{\sqrt{37}}{6} \Rightarrow \quad Z = \frac{\sqrt{37}}{6} \cdot Z^h = -76,0345 \text{ kN}$$

vrijednosti sila u „slomljenim” zategama:



$$\sum_{\widehat{AD}} M_{/D} = 0 : \quad -3 \cdot S_1^h + 3 \cdot Z^h + 1 \cdot Q = 0$$

$$\Rightarrow \quad S_1^h = Z^h + \frac{1}{3} \cdot Q = -75 + \frac{1}{3} \cdot 50 = -58,3333 \text{ kN}$$

$$\frac{S_1^y}{S_1^h} = \frac{2,5}{1,5} \Rightarrow \quad S_1^y = \frac{5}{3} \cdot S_1^h = -97,2222 \text{ kN}$$

$$S_1 = -\sqrt{S_1^h + S_1^y} = -113,380 \text{ kN}$$

$$T_{FI} = \frac{0 + 38,8889}{\sqrt{0,5^2 + 1,5^2}} = 24,5955 \text{ kN}$$

$$T_{IA} = -\frac{38,8889 + 0}{\sqrt{1^2 + 1^2}} = -27,4986 \text{ kN}$$

$$T_{BJ} = -\frac{0 + 50}{\sqrt{1^2 + 1^2}} = -35,3553 \text{ kN}$$

$$T_{JG} = \frac{50 + 0}{\sqrt{0,5^2 + 1,5^2}} = 31,6228 \text{ kN}$$

$$T_{BH} = \frac{0 + 50}{1} = 50 \text{ kN}$$

$$T_{HE} = -\frac{50 + 0}{2} = -25 \text{ kN}$$

$$T_{AK} = \frac{0 + 33,3334}{2} = 16,6667 \text{ kN}$$

$$T_{KD}^g = -\frac{33,3334 + 0}{1} = -33,3334 \text{ kN}$$

dijagrami:

