

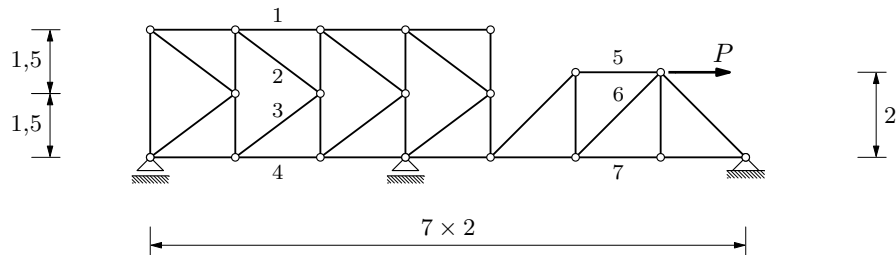
# GS 1. — 1. kolokvij (A) (2024./2025.)

## Culmannov postupak

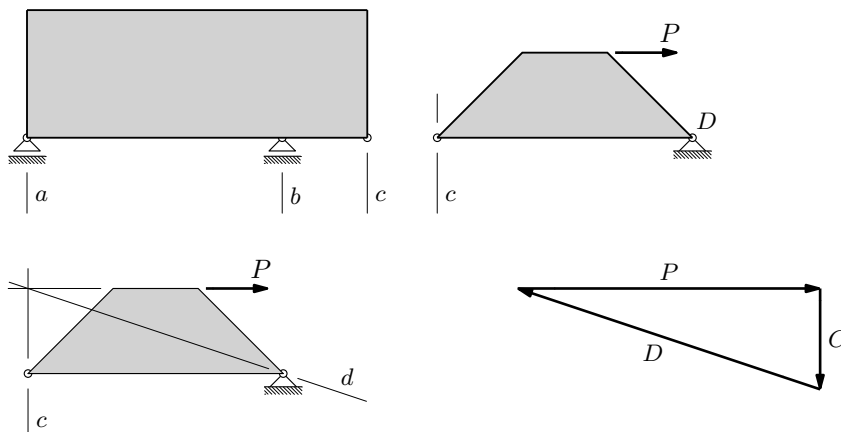
### Zadatak 1.

Culmannovim postupkom odredite sile u štapovima 1–7!

$$P = 100 \text{ kN}$$



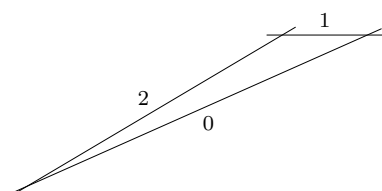
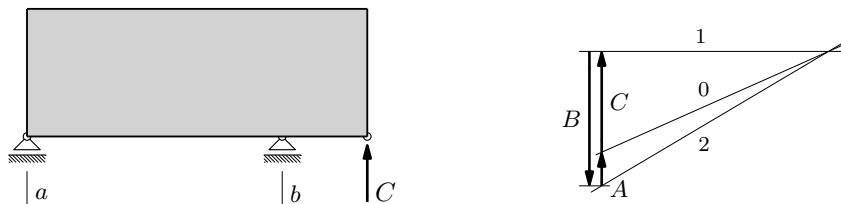
reakcije:



$$\text{mjerilo sila: } 1 \text{ cm} :: 25 \text{ kN} \quad \Rightarrow \quad \tilde{P} = 4 \text{ cm}$$

$$\text{očitano: } \tilde{C} = 13 \text{ i } \frac{1}{3} \text{ mm} \quad \Rightarrow \quad C = 33,3 \text{ kN}$$

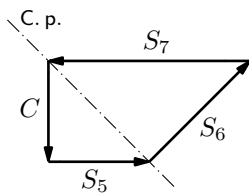
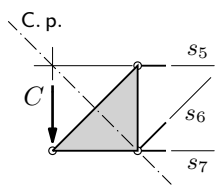
$$\tilde{D} = 42 \text{ i } \frac{1}{4} \text{ mm} \quad \Rightarrow \quad D = 105,6 \text{ kN}$$



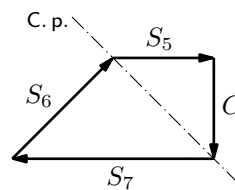
$$\tilde{B} = 17 \text{ i } \frac{3}{4} \text{ mm} \quad \Rightarrow \quad B = 44,4 \text{ kN}$$

$$\tilde{A} = 4 \text{ i } \frac{1}{2} \text{ mm} \quad \Rightarrow \quad A = 11,3 \text{ kN}$$

sile u štapovima 5, 6 i 7:



ili

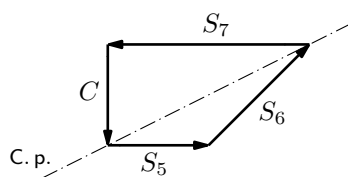
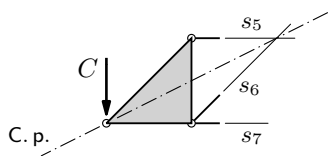


$$\tilde{S}_5 = 13 \text{ i } 1/3 \text{ mm} \Rightarrow S_5 = 33,3 \text{ kN}$$

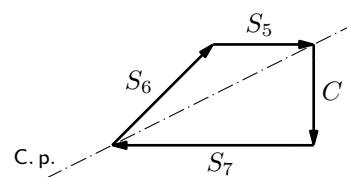
$$\tilde{S}_6 = 18 \text{ i } 3/4 \text{ mm} \Rightarrow S_5 = 46,9 \text{ kN}$$

$$\tilde{S}_7 = 26 \text{ i } 2/3 \text{ mm} \Rightarrow S_5 = 66,7 \text{ kN}$$

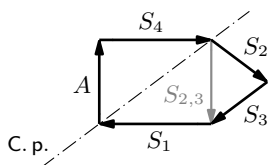
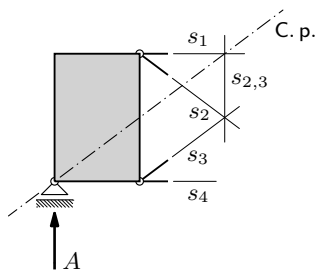
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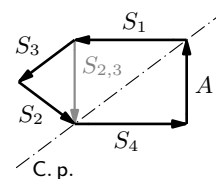
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sile u štapovima 1-4:



ili



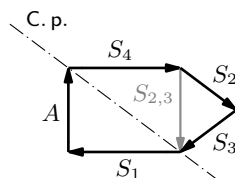
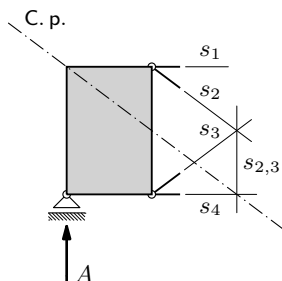
mjerilo sila: 1 cm :: 10 kN

$$\Rightarrow \tilde{A} = 11 \text{ i } 1/3 \text{ mm}$$

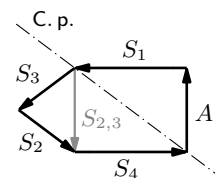
$$\tilde{S}_1 = \tilde{S}_4 = 14 \text{ i } 3/4 \text{ mm} \Rightarrow S_1 = S_4 = 14,8 \text{ kN}$$

$$\tilde{S}_3 = \tilde{S}_3 = 9 \text{ i } 1/4 \text{ mm} \Rightarrow S_2 = S_3 = 9,3 \text{ kN}$$

ili:



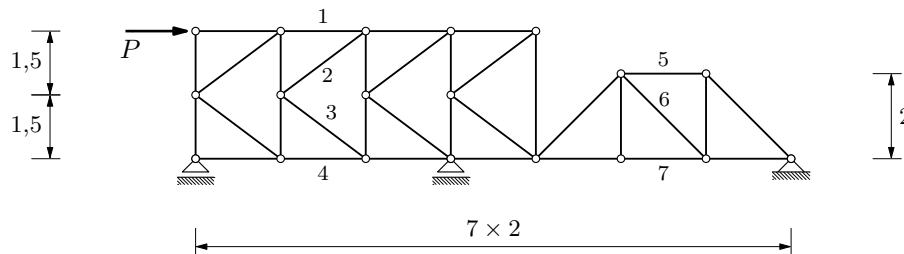
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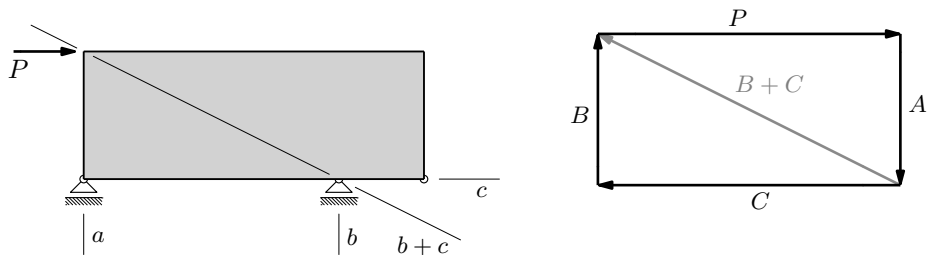
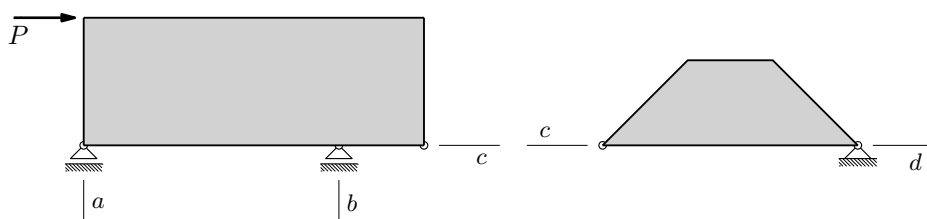
**Zadatak 2.** (varijacija na temu, nije bio u kolokviju)

Culmannovim postupkom odredite sile u štapovima 1–7!

$$P = 100 \text{ kN}$$



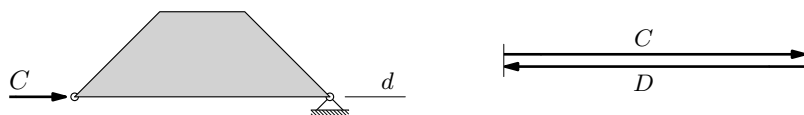
reakcije:



mjerilo sila:  $1 \text{ cm} :: 25 \text{ kN} \Rightarrow \tilde{P} = 4 \text{ cm}$

$$C = P = 100 \text{ kN}$$

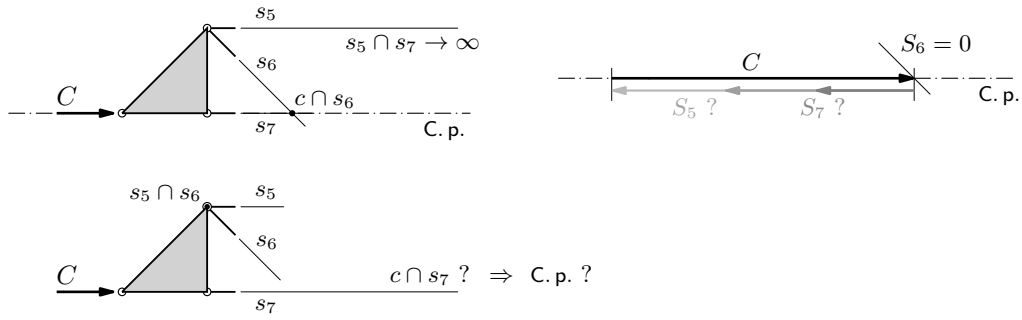
očitano:  $\tilde{A} = 20 \text{ mm} \Rightarrow A = B = 50 \text{ kN}$



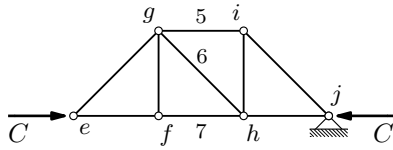
$$D = C = 100 \text{ kN}$$

sile u štapovima 5, 6 i 7 — ne mogu se odrediti Culmannovim postupkom:





jednostavna metoda čvorova (bez crtanja — trebalo bi biti očito):



ravnoteža čvora  $e$ :  $S_{e,g} = 0$     $\&$     $S_{e,f} = C$

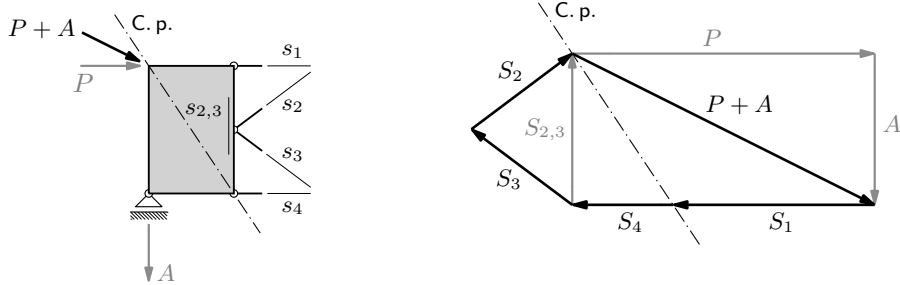
$f$ :  $S_{f,g} = 0$     $\&$     $S_{f,h} = S_7 = C$

$g$ :  $S_{g,i} = S_5 = 0$     $\&$     $S_{g,h} = S_6 = 0$

$j$ :  $S_{i,j} = 0$     $\&$     $S_{h,j} = C$  (potpunosti radi)

$i$ :  $S_{i,h} = 0$  (potpunosti radi)

sile u štapovima 1–4:



ili:

