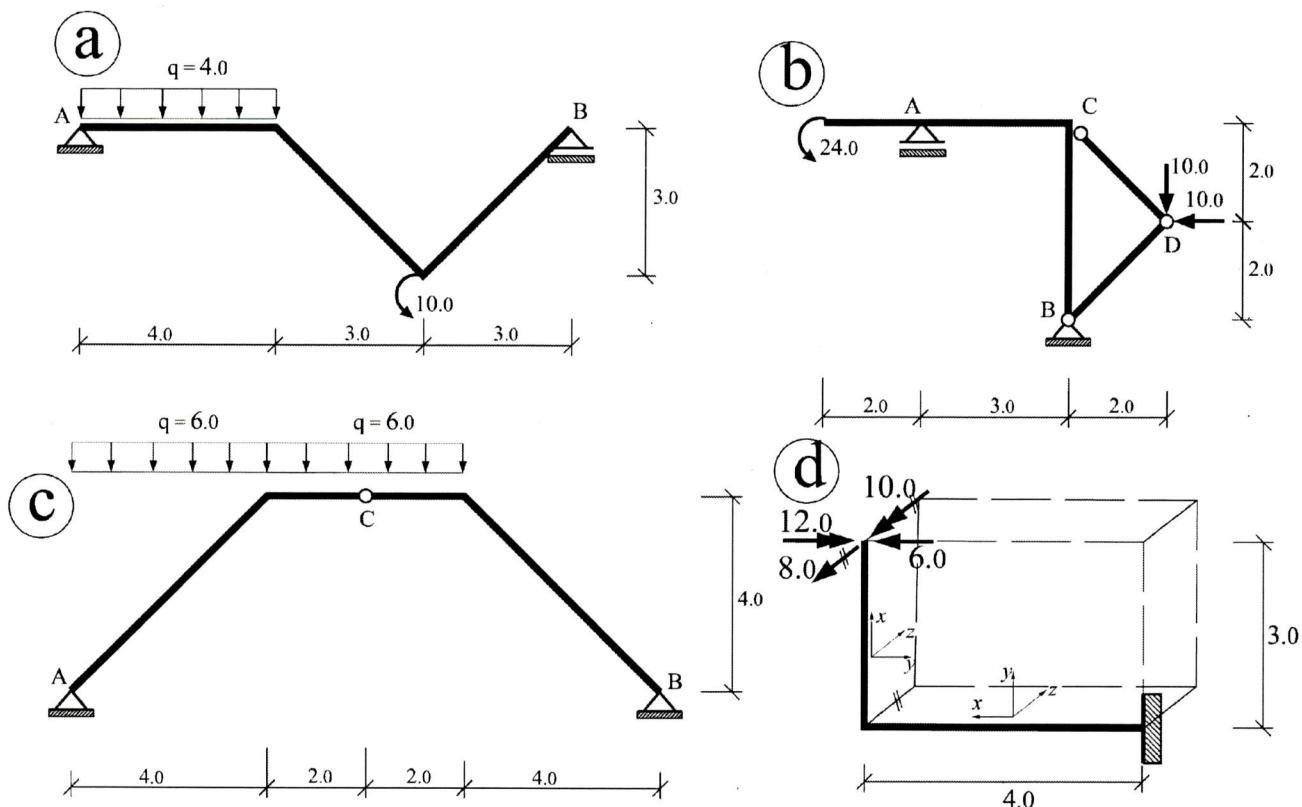


1. Задатак (50% условни задатак)

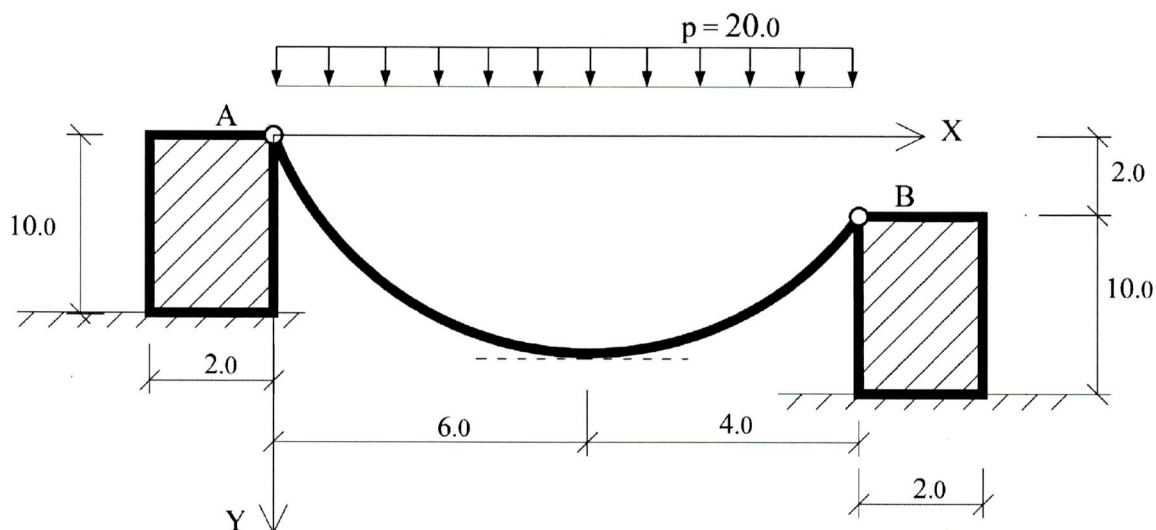
1a), 1b), 1c), 1d) Нацртати дијаграме сила у пресеку.

2. Задатак (50%)

- a) Одредити једначину приказане ланчанице, као и силе у ланчаници у тачкама А и В ($S_A, S_B = ?$)
- b) На основу добијених сила S_A, S_B , израчунати коефицијент сигурности на клизање и претурање блокова 1 и 2, чије су тежине једнаке $G = 1500 \text{ kN}$. Коефицијент трења подлоге је $\mu = 0.1$.

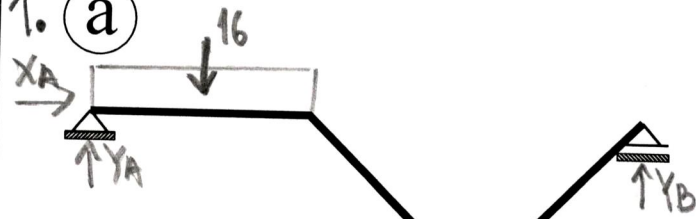


2.

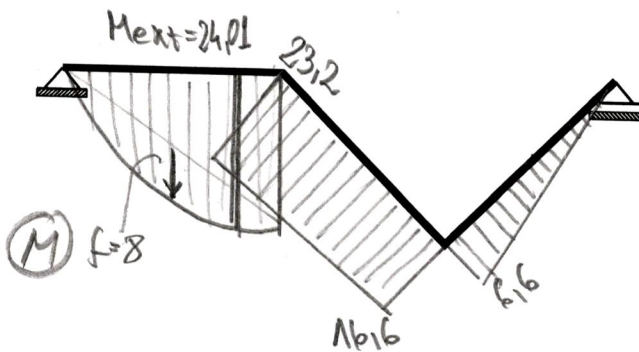
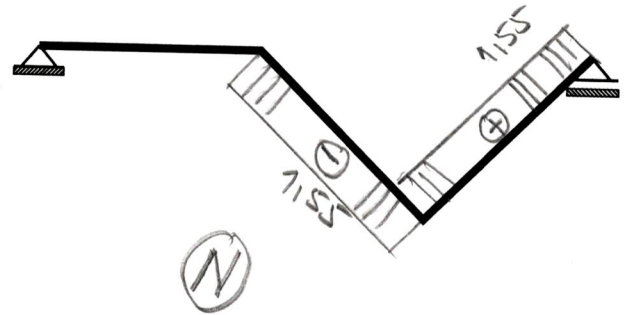
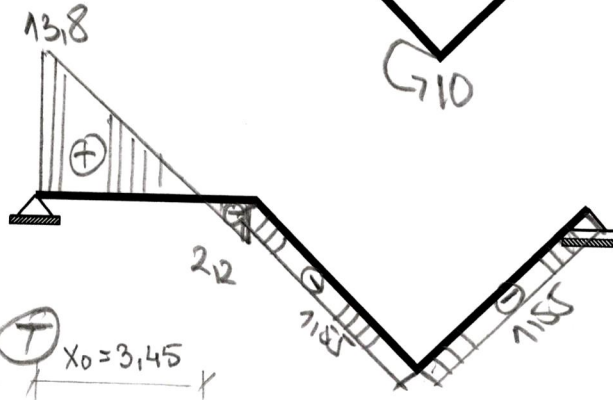


Напомена: У свим задацима димензије су: m, kN

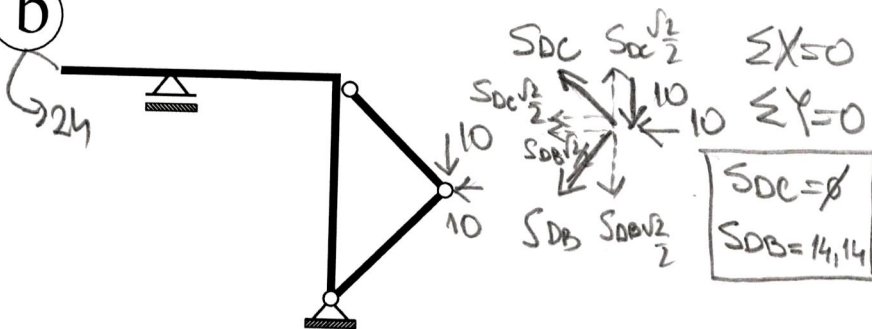
1. (a)



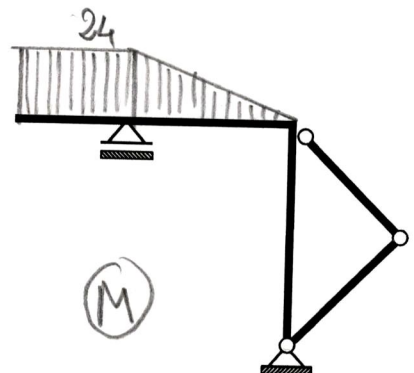
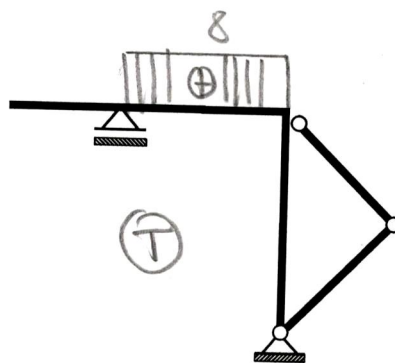
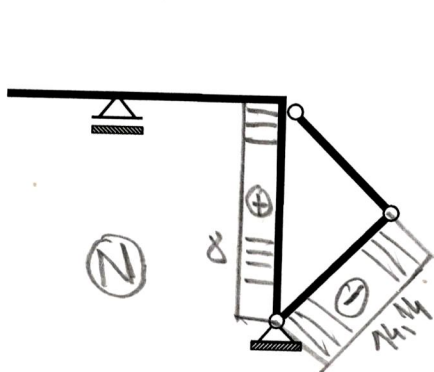
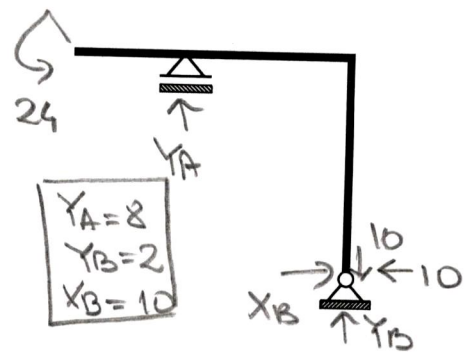
$$\begin{aligned} \sum M_A = 0 &\Rightarrow Y_B = 2.2 \\ \sum Y = 0 &\Rightarrow Y_A = 13.8 \\ \sum X = 0 &\Rightarrow X_A = 0 \end{aligned}$$



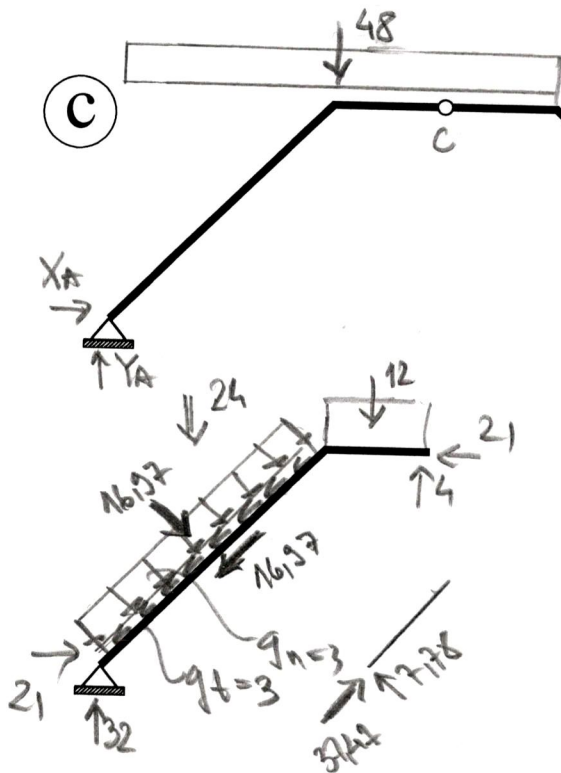
(b)



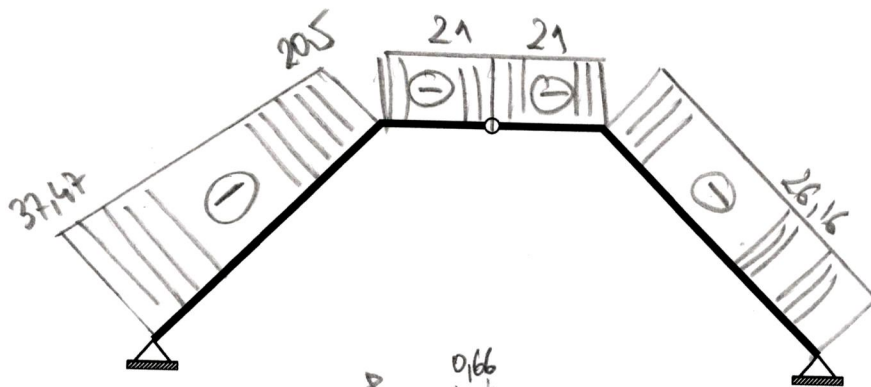
$$\begin{aligned} \sum X = 0 & \\ \sum Y = 0 & \\ SDC = 0 & \\ SDB = 14.14 & \end{aligned}$$



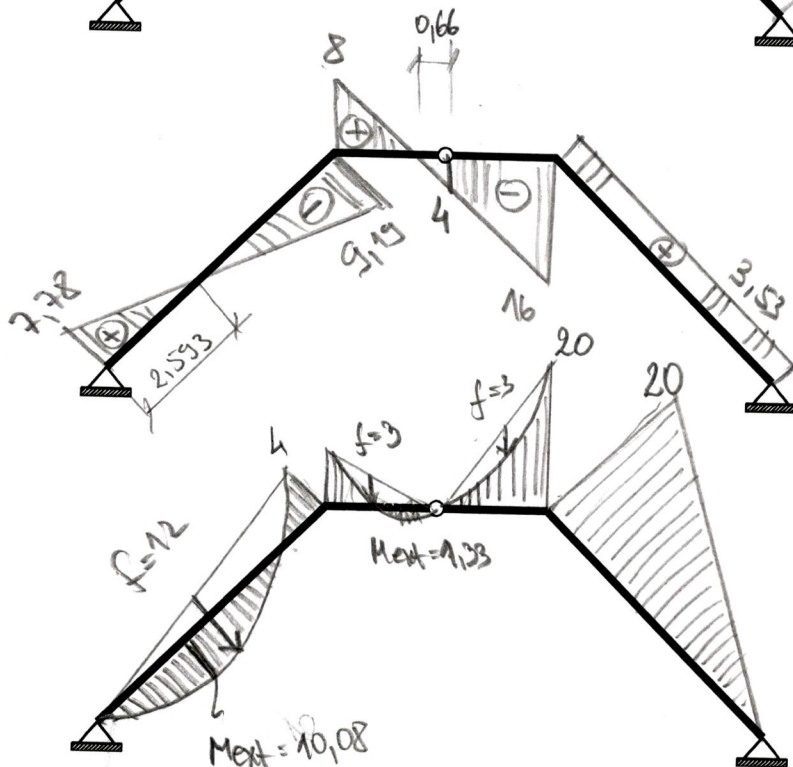
(C)



$$\begin{aligned}\sum M_A = 0 &\Rightarrow Y_B = 16 \\ \sum Y = 0 &\Rightarrow Y_A = 32 \\ \sum M_C = 0 &\Rightarrow X_B = 21 \\ \sum X = 0 &\Rightarrow X_A = 21\end{aligned}$$

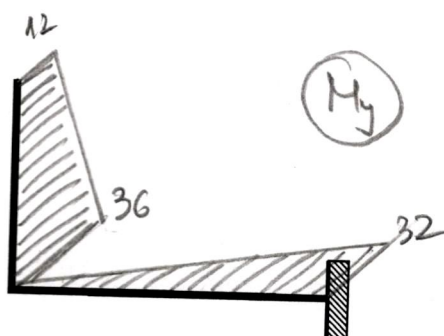
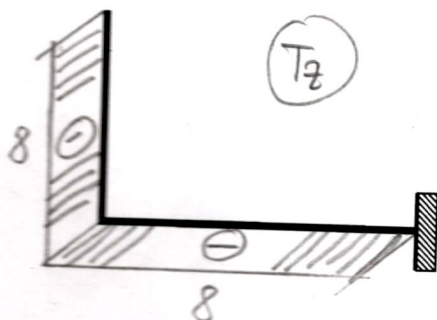
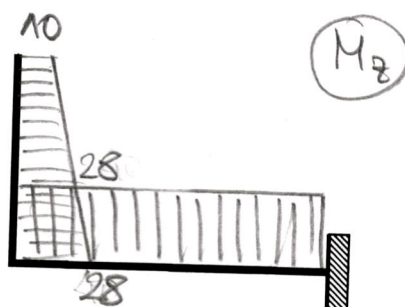
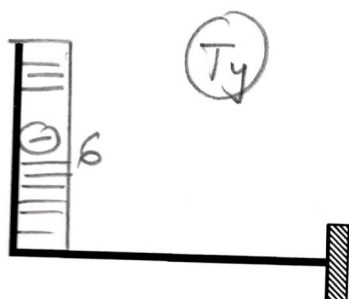
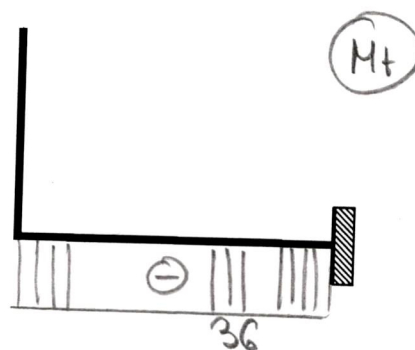
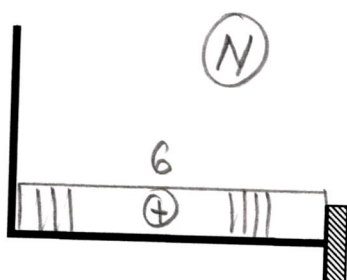
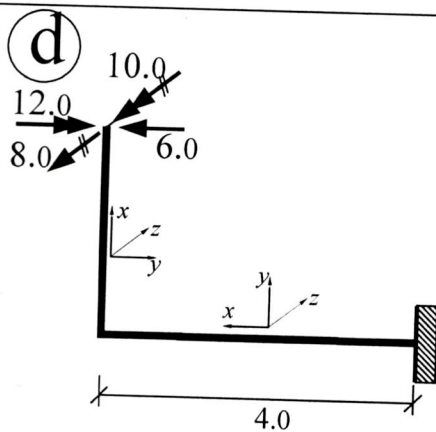


(N)

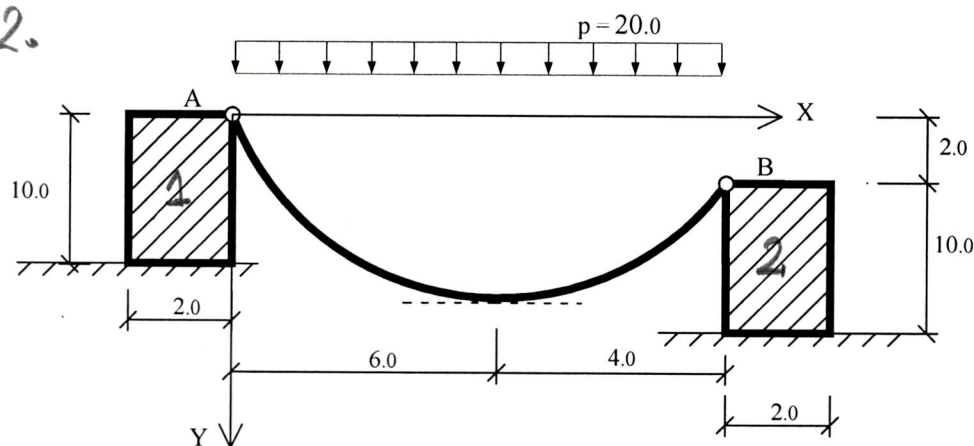


(T)

(M)



2.



У-НА ЛАНЧАНИЦЕ

$$y = -\frac{1}{2} \frac{p}{H} x^2 + C_1 x + C_2 \Rightarrow y = -\frac{1}{2} \frac{20}{H} x^2 + C_1 x + C_2 \Rightarrow y' = -\frac{20}{H} x + C_1$$

ГРАНИЧНИ УСЛОВИ

$$1) y(0) = 0 \Rightarrow C_2 = 0$$

$$2) y(10) = 2 \Rightarrow -\frac{1}{2} \frac{20}{H} \cdot 100 + C_1 \cdot 10 = 2$$

ПРЕДВАЖНИ УСЛОВ:

$$3) y'(6) = 0 \Rightarrow -\frac{20}{H} \cdot 6 + C_1 = 0 \Rightarrow C_1 = \frac{120}{H}$$

$$\rightarrow 2) \Rightarrow -\frac{1000}{H} + 10 \cdot \frac{120}{H} = 2 \Rightarrow \frac{200}{H} = 2 \Rightarrow H = 100 \Rightarrow C_1 = 1.2$$

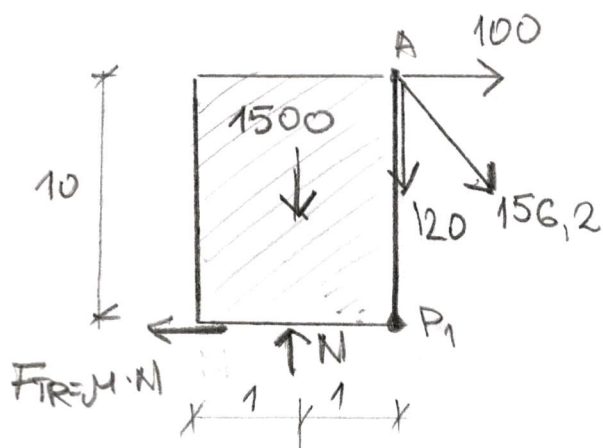
$$\text{У-НА ЛАНЧАНИЦЕ: } \boxed{y = -\frac{1}{10} x^2 + 1.2x} \quad y' = -\frac{1}{5} x + 1.2$$

$$\text{СИЛА У ЛАНЧАНИЦИ: } S = H \sqrt{1 + (y')^2}$$

$$\text{ТАЧКА В: } y'_B = y'(10) = -\frac{1}{5} \cdot 10 + 1.2 = -0.8 \Rightarrow S_B = 100 \sqrt{1 + (-0.8)^2} = 128.06 \text{ kN}$$

$$\text{ТАЧКА А: } y'_A = y'(0) = 0 + 1.2 = 1.2 \Rightarrow S_A = 100 \sqrt{1 + (1.2)^2} = 156.2 \text{ kN}$$

БЛОК 1



$$\gamma_{PR}^{(1)} = \frac{M_{P1}^*}{M_{P1}} - \text{момент отпора претупању}$$

M_{P1} — момент претупања

$$M_{P1} = 100 \cdot 10 = 1000 \text{ kNm}$$

$$M_{P1}^* = 1500 \cdot 1 = 1500 \text{ kNm}$$

$$\gamma_{PR}^{(1)} = \frac{1500}{1000} = 1,5 \quad \text{коэф. сигурности на претупање}$$

$$N = 1500 + 120 = 1620 \text{ kN}$$

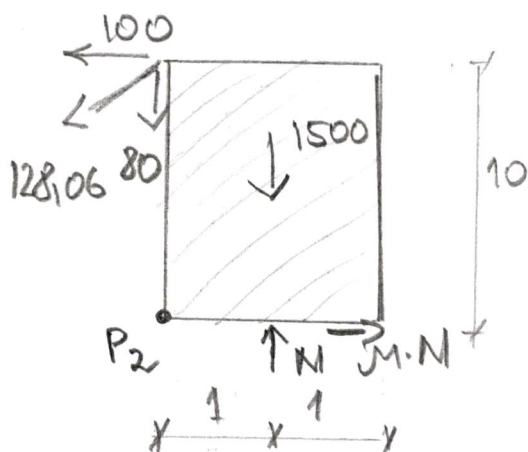
$$\gamma_{KL}^{(1)} = \frac{F_{KL}^*}{F_{KL}} - \text{сила која се супроставља клизању}$$

F_{KL} — сила која је потребна да се тело клизне

$$F_{KL} = 100 \text{ kN}, \quad F_{KL}^* = \mu \cdot N = 0,1 \cdot 1620 = 162$$

$$\gamma_{KL}^{(1)} = \frac{162}{100} = 1,62$$

БЛОК 2



$$\gamma_{PR}^{(2)} = \frac{M_{P2}^*}{M_{P2}}$$

$$M_{P2} = 100 \cdot 10 = 1000 \text{ kNm}$$

$$M_{P2}^* = 1500 \cdot 1 = 1500 \text{ kNm}$$

$$\gamma_{PR}^{(2)} = \frac{1500}{1000} = 1,5$$

$$N = 1500 + 80 = 1580 \text{ kN}$$

$$\gamma_{KL}^{(2)} = \frac{F_{KL}^*}{F_{KL}}, \quad F_{KL} = 100 \text{ kN}$$

$$F_{KL}^* = \mu \cdot N = 0,1 \cdot 1580 = 158 \text{ kN}$$

$$\gamma_{KL}^{(2)} = \frac{158}{100} = 1,58$$