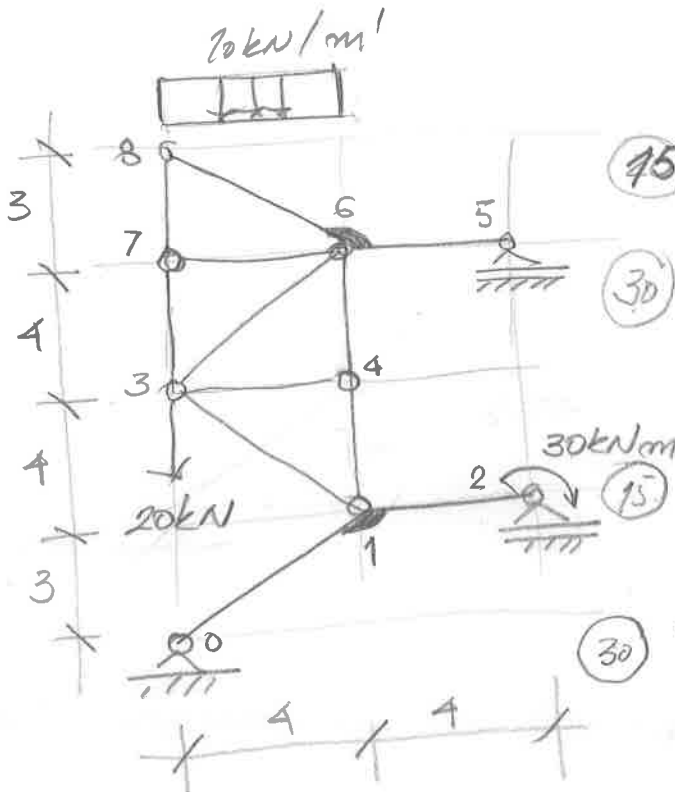


23.04.2021.

TEHNIČKA MEHANIKA 1.

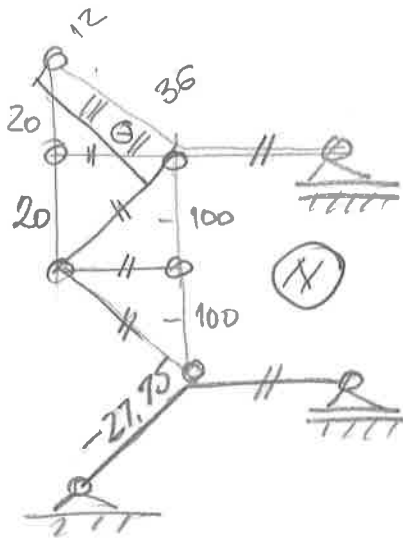
ZA NOSAČ NA SKICI TREBA:



- a) ODREDITI REAKCIJE OSKONACA I SILE VEZA (15)
- b) SRAČUNATI I NACRTATI DIOGRAME PRESEČNIH SILA M, T, N. (30)
- c) ISPISATI ANALITIČKE IZRAZE ZA SILE U PRESEKU M(2), T(2) I N(2) ZA STAP 8-6 (15)
- d) SILE U STABOVIMA REŠETICE S₃₄, S₃₆ I S₃₇ ODREDITI METODOM RIGERA I KULMANA A PREOSTALE METODOM ČVOROVA ANALITIČKI (30)

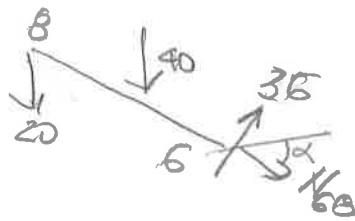
MEZODOM ČVOROVA ANALITIČKI
 e) MOMENT M₆ ODREDITI METODOM VIRTUELNOG RADA

(10)



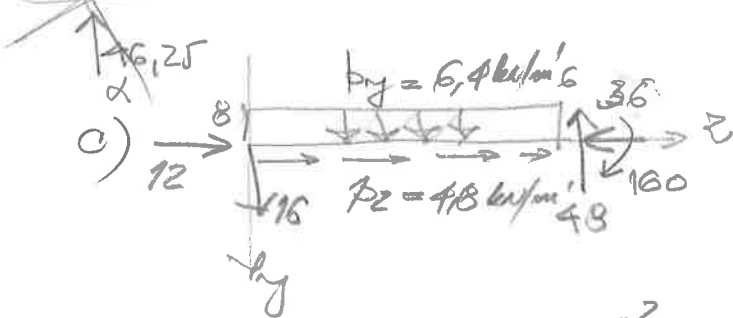
$$\sum H = N_{86} \cdot 0,8 + 16 \cdot 0,6 = 0$$

$$N_{86} = -12 \text{ kN}$$



$$\sum H = N_{68} \cdot 0,8 + 48 \cdot 0,6 = -36$$

$$\sum H = N_{01} \cdot 0,8 + 37 \cdot 0,6 = 0 \Rightarrow N_{01} = -27,75$$



$$p_y = \frac{p \cdot l \cdot \cos \alpha}{L_{86}} = \frac{10 \cdot 4 \cdot 0,8}{5} = 6,4 \text{ kN/m}$$

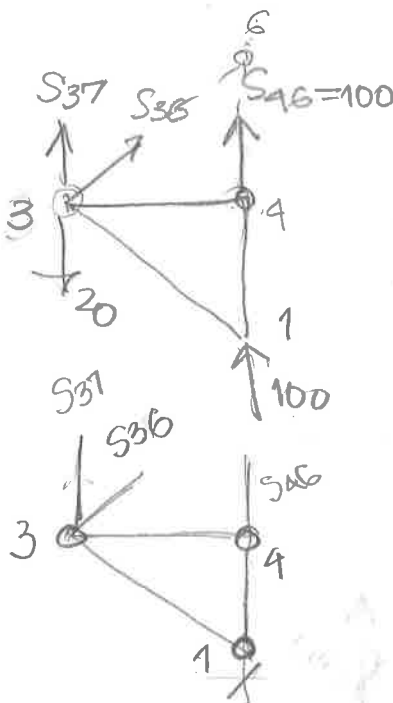
$$p_z = \frac{p \cdot l \cdot \sin \alpha}{L_{86}} = \frac{10 \cdot 4 \cdot 0,6}{5} = 4,8 \text{ kN/m}$$

$$M_x(z) = -16 \cdot z - 6,4 \cdot \frac{z^2}{2} = -16z - 3,2z^2 \quad M_x(5) = -160 \text{ V}$$

$$T_y(z) = -16 - 6,4z \quad T_y(0) = -16 \quad T_y(5) = -48 \text{ V}$$

$$N(z) = -12 - 4,8z \quad N(0) = -12 \quad N(5) = -36 \text{ V}$$

d)

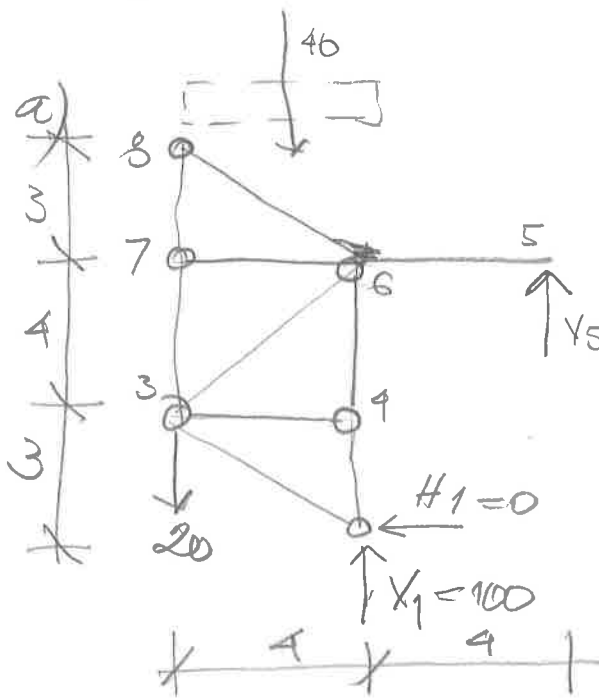


$$\sum M_3 = (100 + S_{46}) \cdot 4 = 0 \quad S_{46} = -100 \text{ kN}$$

$$\sum M_6 = (20 - S_{37}) \cdot 4 = 0 \quad S_{37} = 20 \text{ kN}$$

$$\sum H = S_{38} \cdot \frac{\sqrt{2}}{2} = 0 \quad S_{38} = 0$$

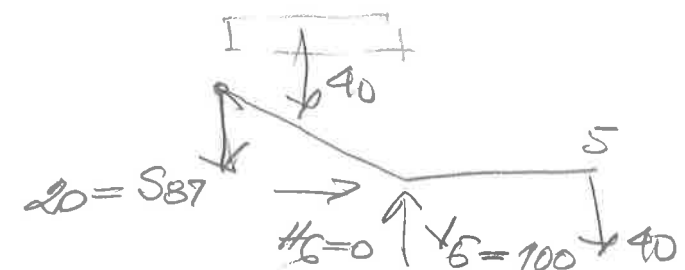




$$\sum M_1 = 40 \cdot 5 + 20 \cdot 2 + 40 \cdot 4 = 0 \quad \underline{V_5 = -40}$$

$$\sum H = H_1 = 0$$

$$\sum V = V_1 - 40 - 40 - 20 = 0 \quad V_1 = 100$$



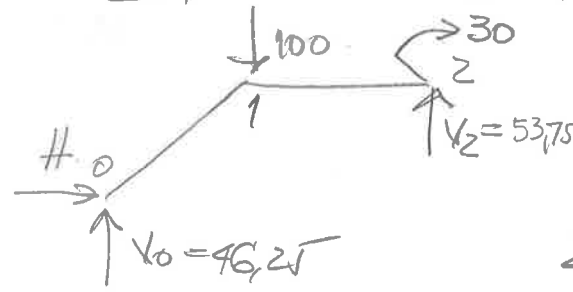
$$\sum H = H_6 = 0$$

$$\sum M_6 = 40 \cdot 5 + 20 \cdot 2 - 40 \cdot 4 = 0$$

$$\sum V = V_6 - 20 - 40 - 40 = 0$$

$$\underline{S_{87} = 20 \text{ kN}}$$

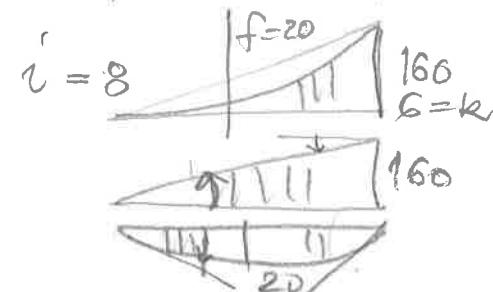
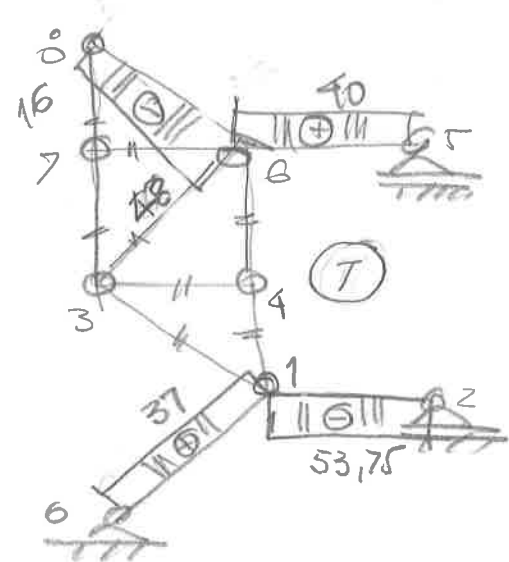
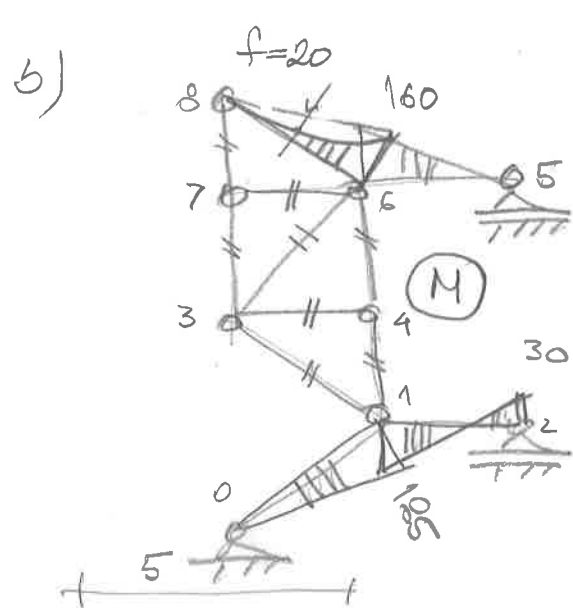
$$\underline{V_6 = 100 \text{ kN}}$$



$$\sum H = H_8 = 0$$

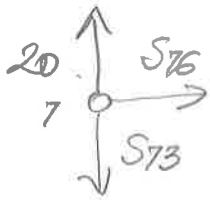
$$\sum M_2 = 8 \cdot V_8 - 4 \cdot 100 + 30 = 0 \quad \underline{V_8 = 46.25}$$

$$\sum V = 46.25 + V_2 - 100 = 0 \quad \underline{V_2 = 53.75}$$



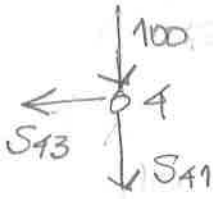
$$T_c = \frac{4f}{L} - \frac{N_k}{L} = \frac{4 \cdot 20 - 160}{5} = -16 \text{ kN}$$

$$T_k = -\frac{4f}{L} - \frac{N_k}{L} = -\frac{4 \cdot 20 + 160}{5} = -48 \text{ kN}$$



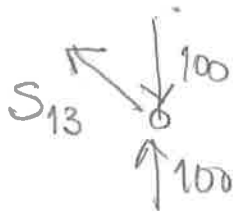
$$\sum H = S_{76} = 0$$

$$\sum V = S_{73} - 20 = 0 \quad S_{73} = 20 \text{ kN}$$



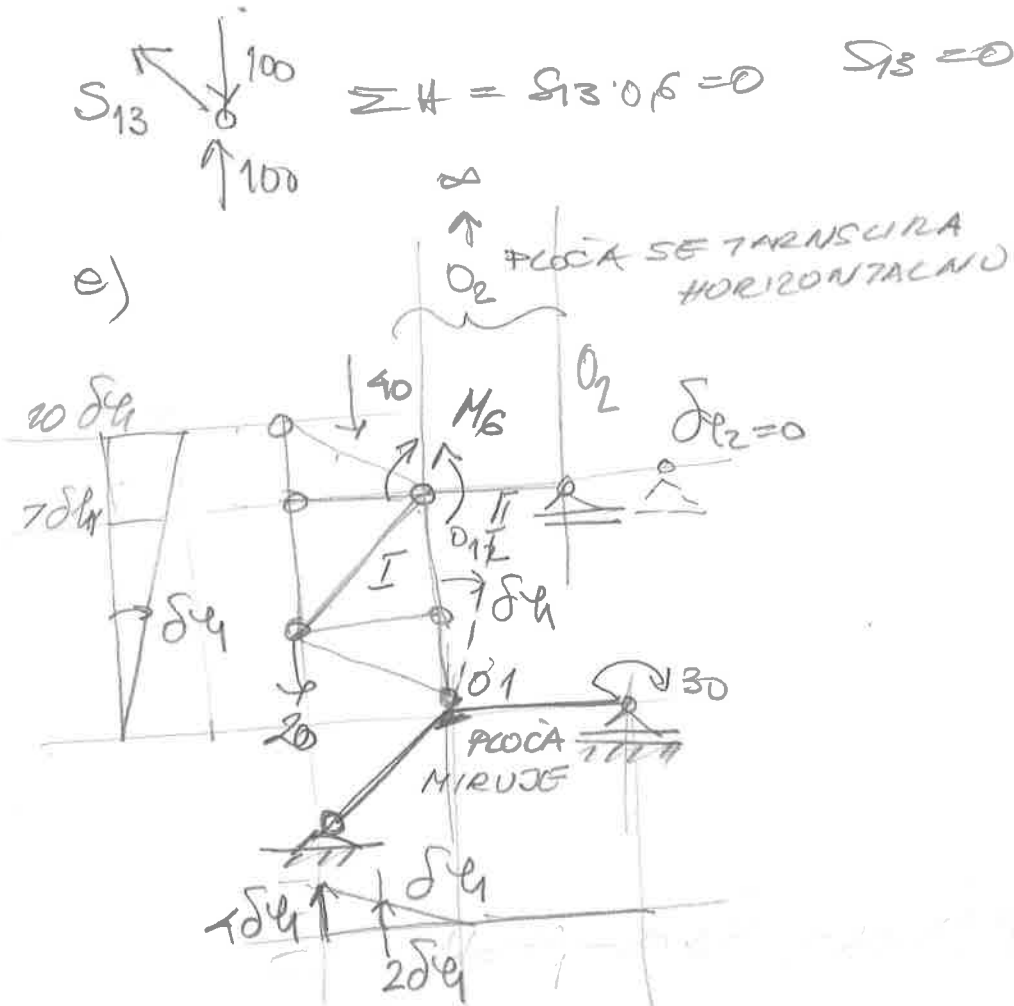
$$\sum H = S_{43} = 0$$

$$\sum V = S_{41} + 100 = 0 \quad S_{41} = -100$$



$$\sum H = S_{13} \cdot 0.6 = 0 \quad S_{13} = 0$$

e)



$$\delta A = M_6 \cdot \delta \varphi - 40 \cdot 20 \delta \varphi - 20 \cdot 40 \delta \varphi = 0$$

$$M_6 = 160 \text{ kNm}$$