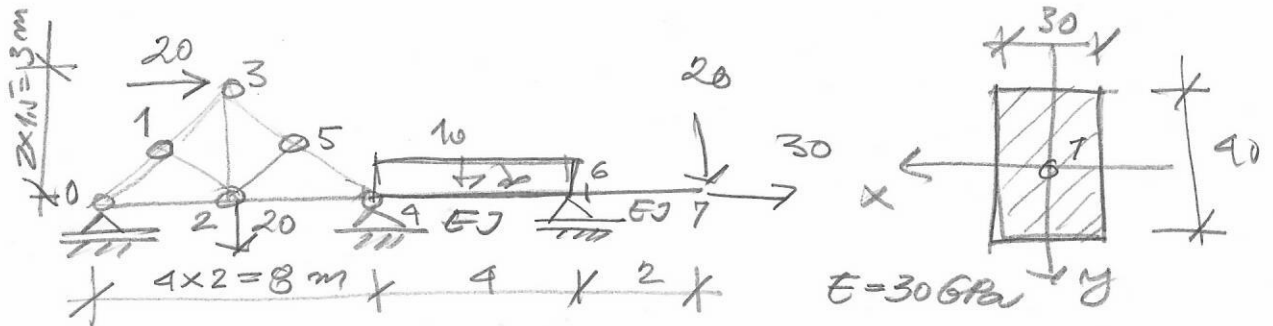


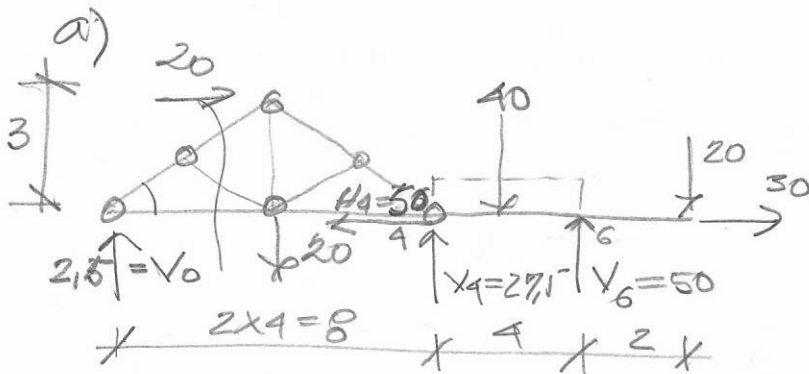
11.09.2020.

MEHANIKA I ODPORNOST MATERIJALA

ZA NOSAČ I OPTEREĆENJE NA SKICI TRČBA:



- 10 a) ISRAČUNATI REAKCIJE OSNOVACA I SILE VEZA
- 25 b) NA PUNOM DELU NOSAČA NACRTATI DIJAGRAME
PRESEČNIH SILA
- 15 c) NA REŠETCI SILE U ŠTAPOVIMA S_{02} , S_{12} I S_{13}
ODREDITI METODAMA RITERA I KULMANA
- 20 d) ZA PRESEK 6 DESNO NACRTATI DIJAGRAME
KOMPONENTALNIH NAPONA
- 30 e) ISRAČUNATI MOB-MAKS. ANALOGIJOM σ_1 , σ_6 I σ_9
I SKICIRATI DEFORMISANU OSU NOSAČA NA DELU
4-6-7



$$M_{4d} = 4V_6 - 6 \cdot 20 - 2 \cdot 40 = 0$$

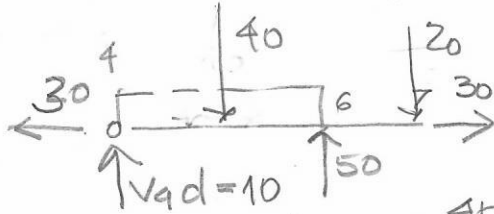
$$V_6 = 50 \text{ kN}$$

$$M_{4l} = 8V_0 + 3 \cdot 20 - 4 \cdot 20 = 0$$

$$V_0 = 2.5 \text{ kN}$$

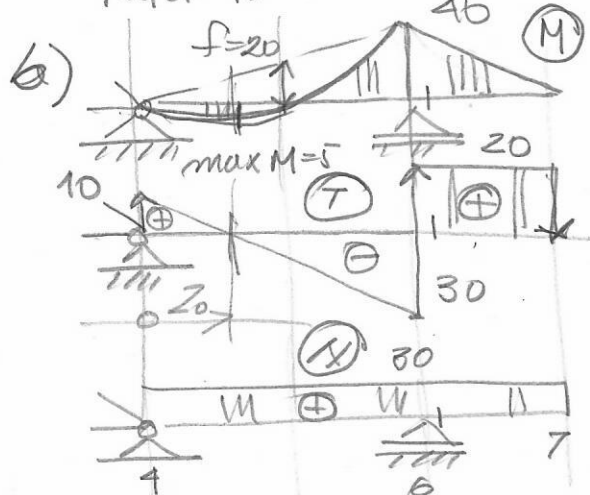
$$\sum V = V_4 + 2.5 + 50 - 40 - 2 \cdot 20 = 0$$

$$V_4 = 27.5 \text{ kN}$$



$$\sum V = V_{4d} + 50 - 40 - 20 = 0$$

$$V_{4d} = 10 \text{ kN}$$



$$f = 10 \cdot \frac{4^2}{8} = 20 \text{ kNm}$$

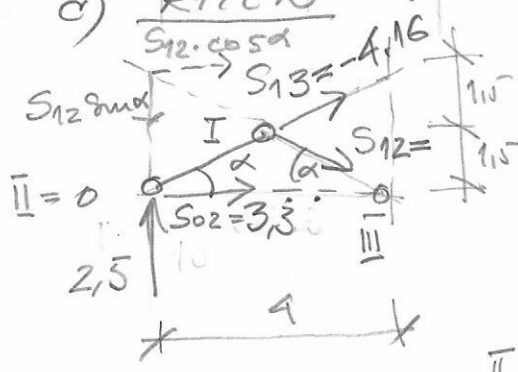
$$\max M_x = M_x(z_0)$$

$$T_y(z_0) = 10 - 10z_0 = 0 \quad z_0 = 1 \text{ m}$$

$$\max M = 10 \cdot 1 - 10 \cdot \frac{1^2}{2} = 5 \text{ kNm}$$

$$\text{tg} \alpha = \frac{3}{4} \quad \cos \alpha = 0.8 \quad \sin \alpha = 0.6$$

c) RIZER

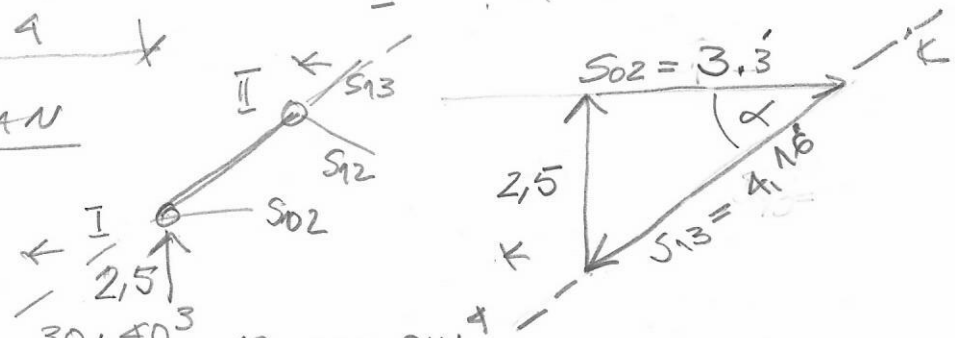


$$\sum M_I = 1.5 S_{02} - 2.5 \cdot 2 = 0 \quad S_{02} = 3.3$$

$$\sum M_{II} = 3 \cdot S_{12} \cos \alpha = 0 \quad S_{12} = 0$$

$$\sum M_{III} = 4(S_{13} \sin \alpha + 2.5) = 0 \quad S_{13} = -4.16$$

KULMAN



$$d) J_x = \frac{30 \cdot 40^3}{12} = 160000 \text{ cm}^4$$

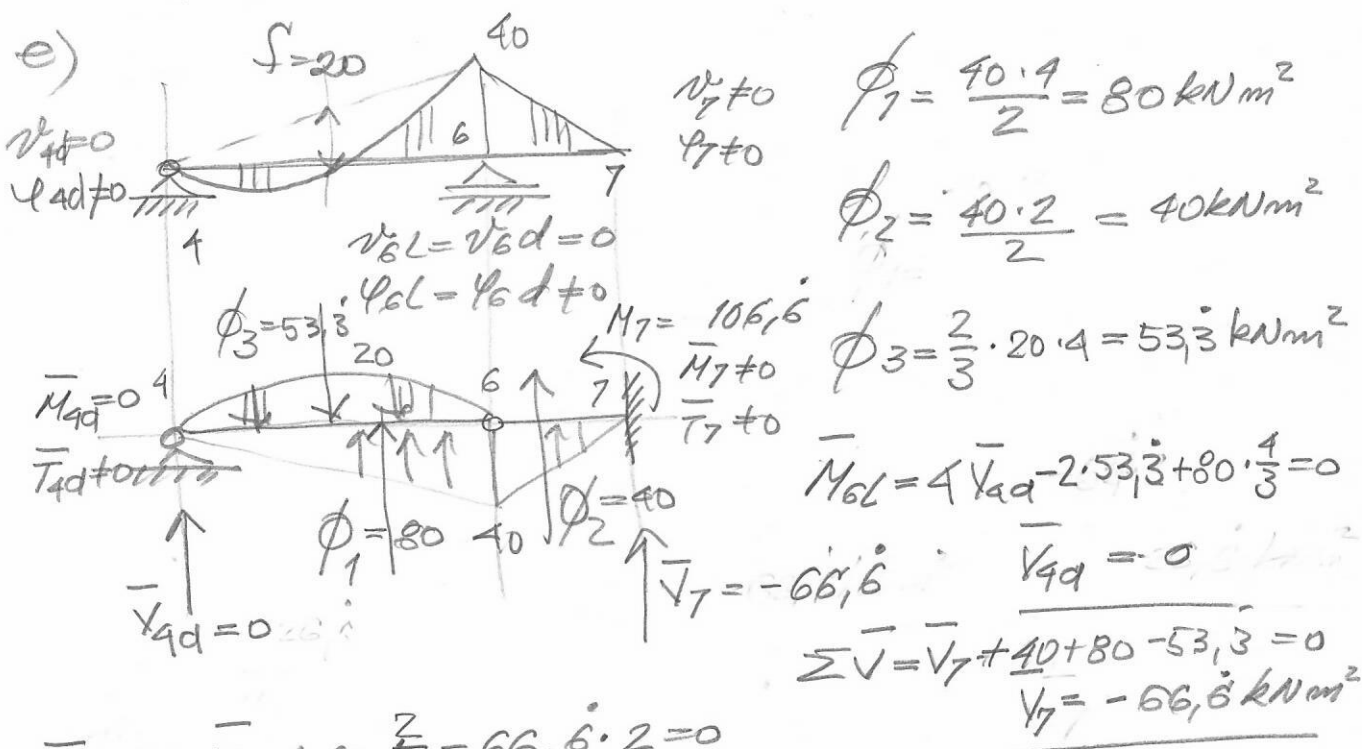
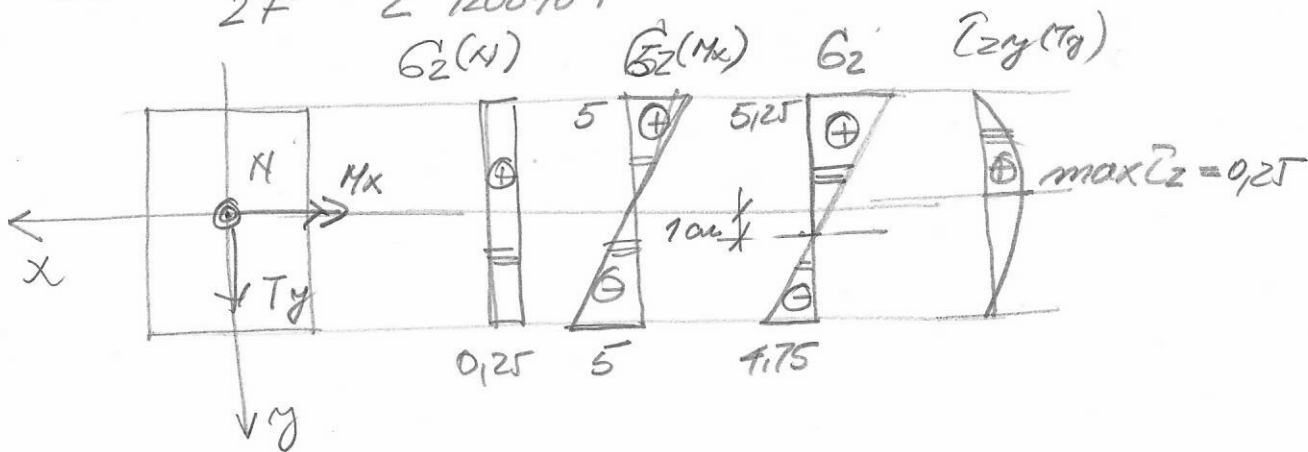
$$F = 30 \cdot 40 = 1200 \text{ cm}^2$$

$$EJ_x = 30 \cdot 10^3 \cdot 160000 \cdot 10^{-8} = 48 \text{ MNm}^2$$

$$\sigma_z = \frac{N}{F} + \frac{M \cdot y_{\max}}{J_x} = \frac{30 \cdot 10^{-3}}{1200 \cdot 10^{-4}} + \frac{40 \cdot 10^3 \cdot 20 \cdot 10^{-2}}{160000 \cdot 10^{-8}} = 0.25 \pm 5$$

$$\sigma_{z, \max} = 5 + 0.25 = 5.25 \text{ MPa} \quad \sigma_{z, \min} = 5 - 0.25 = 4.75 \text{ MPa}$$

$$\tau_{max} = \frac{3 T_y}{2 F} = \frac{3 \cdot 20 \cdot 10^{-3}}{2 \cdot 1200 \cdot 10^{-9}} = 0,25 \text{ MPa}$$



$$\bar{M}_6 = \bar{M}_7 + 40 \cdot \frac{2}{3} - 66,6 \cdot 2 = 0$$

$$\bar{M}_7 = 106,6 \text{ kNm}^3$$

$$\bar{v}_7 = \frac{\bar{M}_7}{EJ_x} = \frac{106,6 \cdot 10^{-3} \text{ MNm}^3}{48 \text{ MNm}^2} = 2,2 \cdot 10^{-3} \text{ m} = 2,2 \text{ mm}$$

$$\phi_6 = \frac{\bar{T}_6}{EJ_x} = \frac{(66,6 - 20) \cdot 10^{-3} \text{ MNm}^2}{48 \text{ MNm}^2} = 0,5 \cdot 10^{-3} \text{ rad}$$

$$\phi_4 = \frac{\bar{T}_4}{EJ_x} = \frac{0 \cdot 10^{-3}}{48} = 0 \text{ rad}$$

