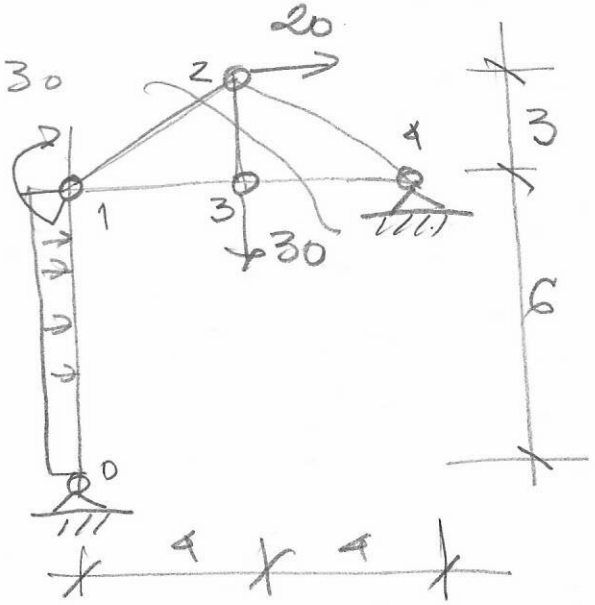
MEHANIKA I OTPORNOST MATERIJALA

PRVI KOLOKVIJUM 26.11.2020.

GRUPA 2.

ZA NOSAČ I OPTEREĆENJE NA SKICI TREBA:



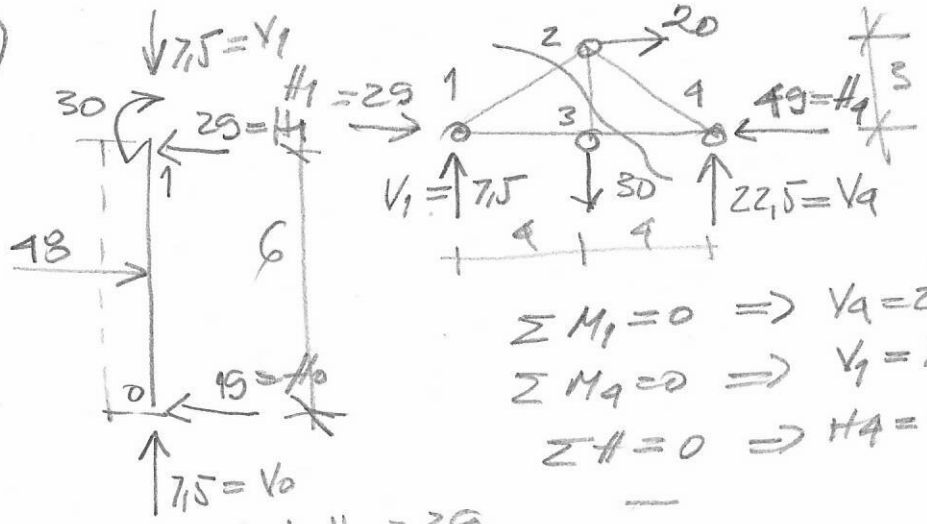
a) SRAČUNATI I NACRTATI REAKCIJE OSLONACA I SILE VEZA

b) NACRTATI DIJAGRAME M, T, N ZA ŠTAP 0–1

c) ISPISATI ANALITIČKE IZRAZE $M_x(z)$, $T_{xy}(z)$, $N(z)$ ZA ISTI ŠTAP

d) ODREDITI SILE U ŠTAPOVIMA U NAZNAČENOM PRESEKU PO DVE METODE.

a)



$\Sigma M_1 = 0 \Rightarrow V_4 = 22{,}5$

$\Sigma M_4 = 0 \Rightarrow V_1 = 7{,}5$

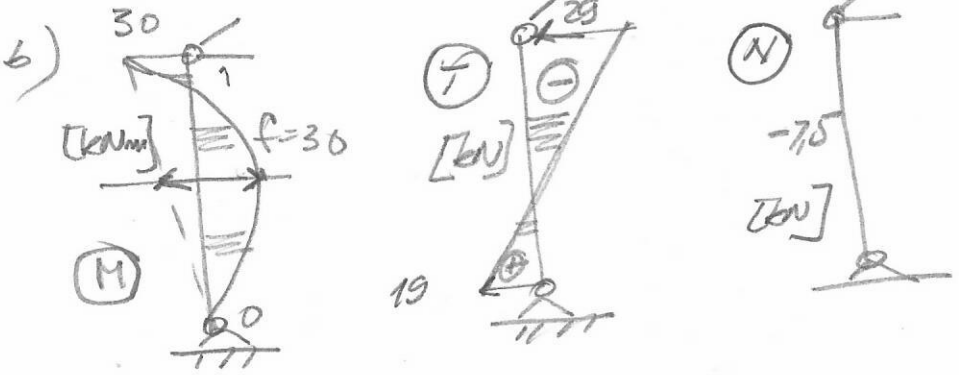
$\Sigma H = 0 \Rightarrow H_4 = 49$

$\Sigma M_0 = 0 \Rightarrow H_1 = 29$

$\Sigma M_1 = 0 \Rightarrow H_0 = 19$

$\Sigma Y = 0 \Rightarrow V_0 = 7{,}5$

b)



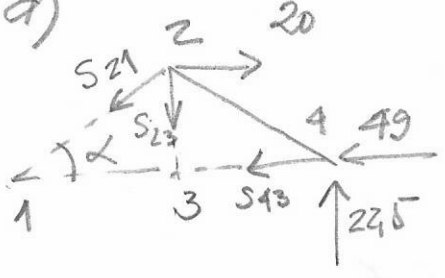
c) $M_x(z) = 19z - 8 \cdot \frac{z^2}{2} = \underline{19z - 4z^2}$

$M_x(0) = 0 \qquad M_x(6) = 19 \cdot 6 - 4 \cdot 6^2 = -30\ kN$

$T_y(z) = 19 - 8z \qquad T_y(0) = 19 \qquad T_y(6) = 19 - 8 \cdot 6 = -29$

$\underline{N_y(z) = -7{,}5}$

d)



$\Sigma M_3 = (S_{21} \cos\alpha - 20) \cdot 3 + 22{,}5 \cdot 4 = 0$

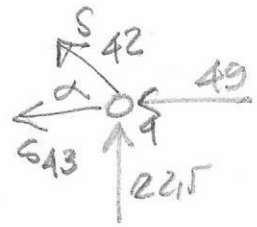
$\underline{S_{21} = -12{,}5\ kN}$

$\Sigma M_1 = 4 \cdot S_{23} + 3 \cdot 20 - 8 \cdot 22{,}5 = 0$

$\underline{S_{23} = 30\ kN}$

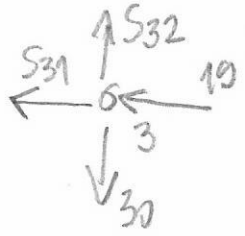
$\Sigma M_2 = -(S_{43} + 49) \cdot 3 - 4 \cdot 22{,}5 = 0$

$\underline{S_{43} = -19}$



$\Sigma V = S_{42} \cdot 0{,}6 + 22{,}5 = 0$ $\quad S_{42} = 37{,}5\ kN$

$\Sigma H = S_{43} - 37{,}5 \cdot 0{,}8 + 19 = 0$ $\quad S_{43} = -19\ kN$



$\Sigma V = S_{32} - 30 = 0$ $\quad S_{32} = 30\ kN$

$\Sigma H = S_{31} + 19 = 0$ $\quad S_{31} = -19\ kN$