UNIVERZITET U BANJALUCI
ARHITEKTONSKO-GRAĐEVINSKO-GEODETSKI FAKULTET
KATEDRA ZA MEHANIKU I TEORIJU KONSTRUKCIJA
STUDIJSKI PROGRAM GRAĐEVINARSTVO

TEHNIČKA MEHANIKA 1

PRVI KOLOKVIJUM

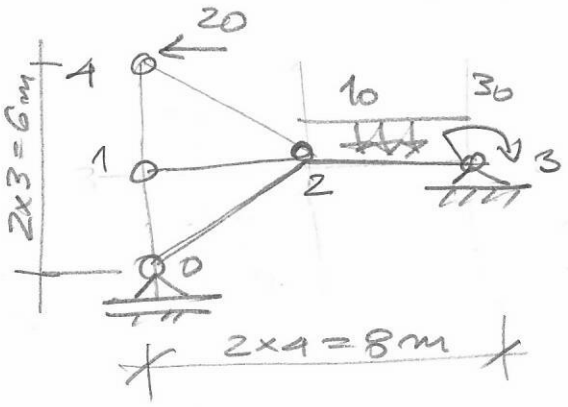
ZA NOSAČ I OPTEREĆENJE NA SLICI TREBA:

30 a) SRAČUNATI I NACRTATI REAKCIJE OSLONACA I SILE VEZA

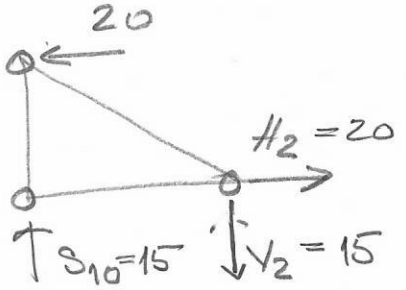
50 b) NACRTATI DIJAGRAME M, T, N ZA DEO 0-2-3

20 c) ISPISATI ANALITIČKE IZRAZE M(z), T(z) I N(z) NA DELU 2-3

30 d) METODOM VIRTUELNOG RADA ODREDITI MOMENT M_2



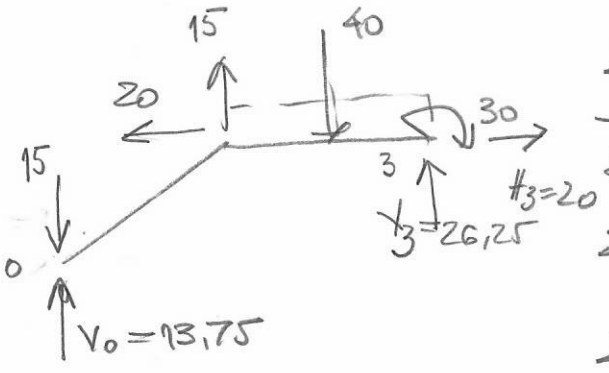
a)



$\rightarrow\sum H = H_2 - 20 = 0 \quad \underline{H_2 = 20}$

$\curvearrowleft\sum M_2 = 4S_{10} - 3\cdot 20 = 0 \quad \underline{S_{10} = 15\,kN}$

$\uparrow\sum V = V_2 - 15 = 0 \quad \underline{V_2 = 15\,kN}$



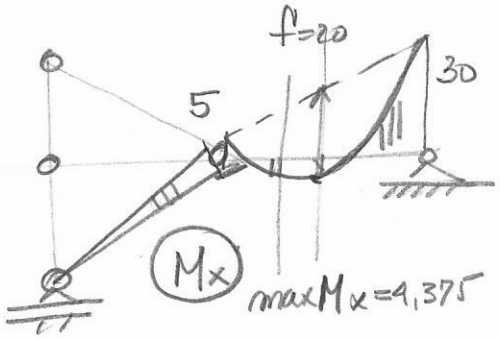
$\rightarrow\sum H = H_3 - 20 = 0 \quad \underline{H_3 = 20}$

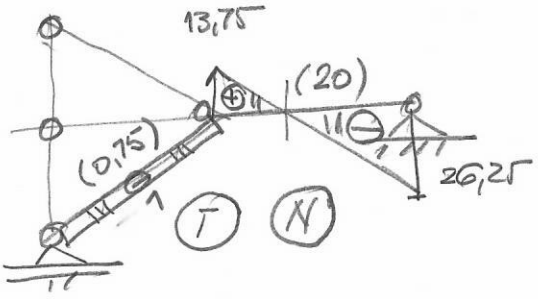
$\curvearrowleft\sum M_3 = V_0\cdot 8 - 15\cdot 4 - 40\cdot 2 + 30 = 0$

$\underline{V_0 = 13,75\,kN}$

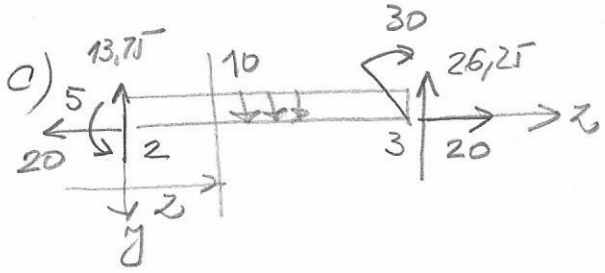
$\sum V = 13,75 - 40 + V_3 = 0 \quad \underline{V_3 = 26,25\,kN}$

b)





c)



$M_x(z) = -5 + 13,75 \cdot z - \frac{10}{2} z^2$

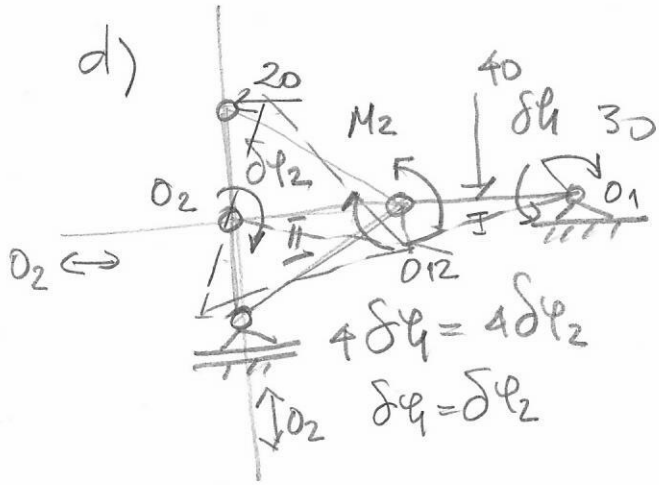
$T_y(z) = 13,75 - 10z$

$N(z) = 20\ kN$

$T_y(z_0) = 13,75 - 10 z_0 = 0 \quad z_0 = 1,375\ m$

$\max M_x = M_x(z_0) = -5 + 13,75 \cdot 1,375 - 5 \cdot 1,375^2 = 4,453\ kNm$

d)



$4\delta\varphi = 4\delta\varphi_2$

$\delta\varphi = \delta\varphi_2$

$\delta A = M_2(\delta\varphi + \delta\varphi_2) - 30\delta\varphi_1 +$

$+ 40 \cdot 2\delta\varphi - 20 \cdot 3\delta\varphi_2 = 0$

$\delta\varphi[2M_2 - 30 + 80 - 60] = 0$

$M_2 = 5\ kNm$