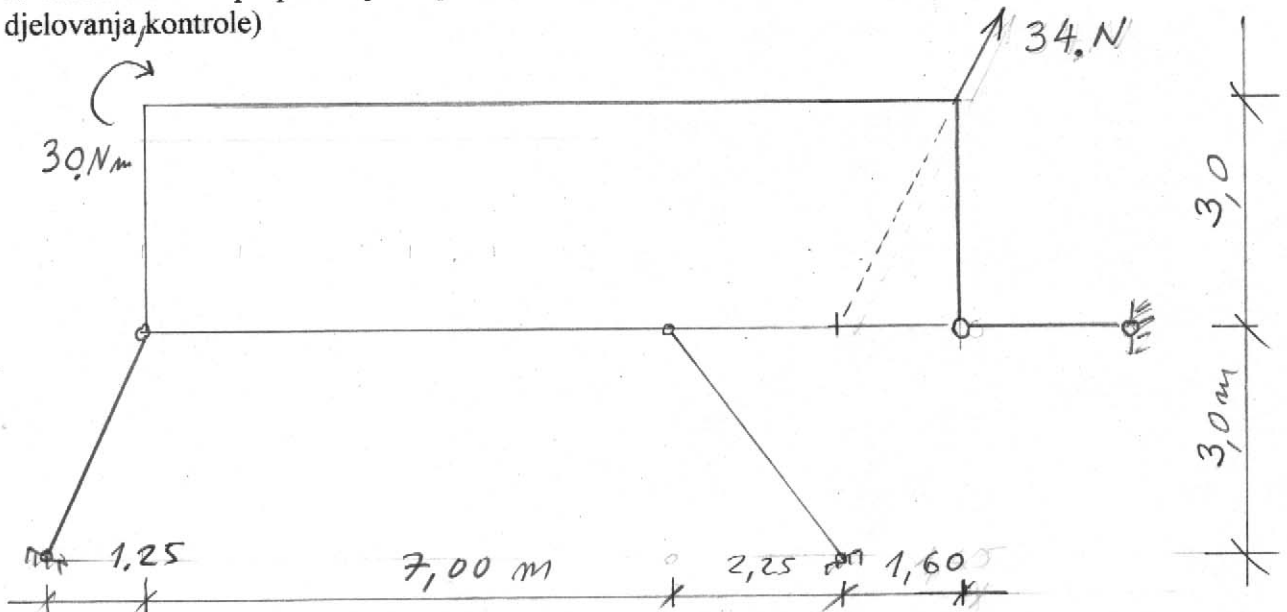
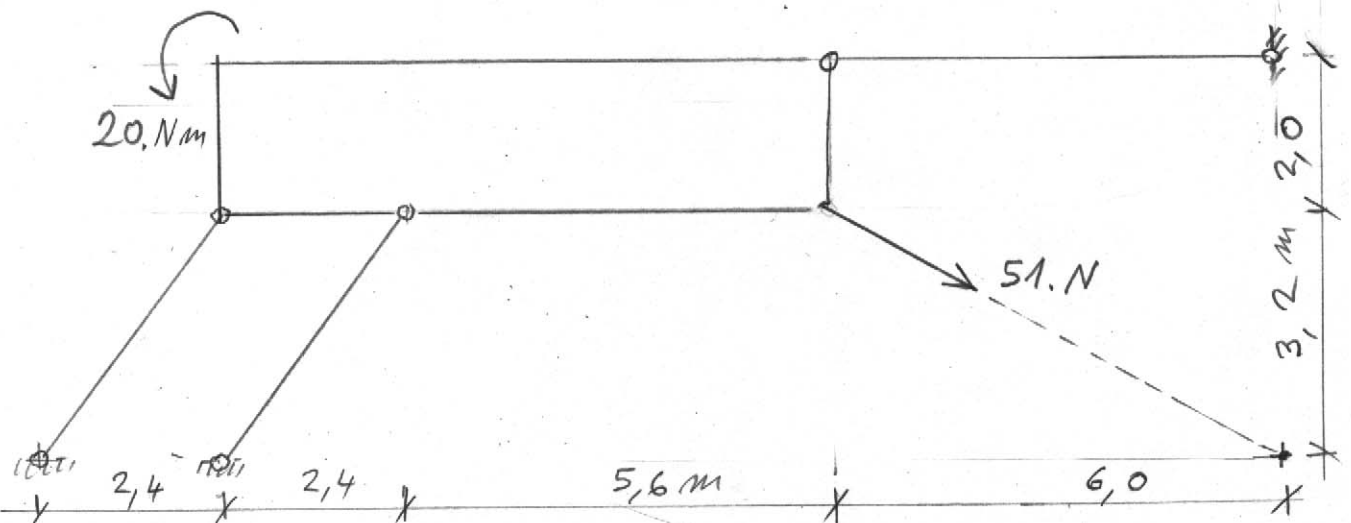


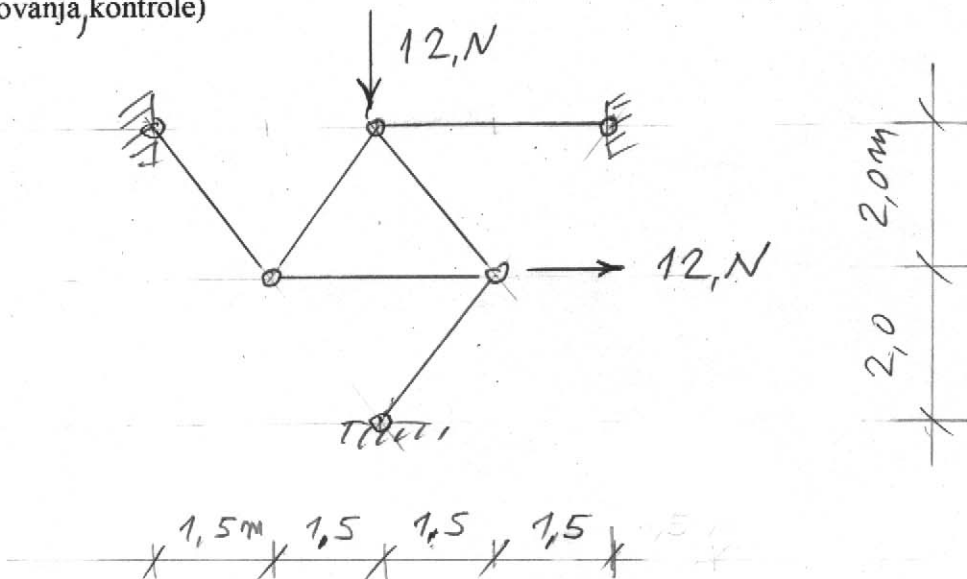
1. Treba računski potpuno riješiti prikazani ravninski sustav (statička shema, postupak, stvarna djelovanja, kontrole)



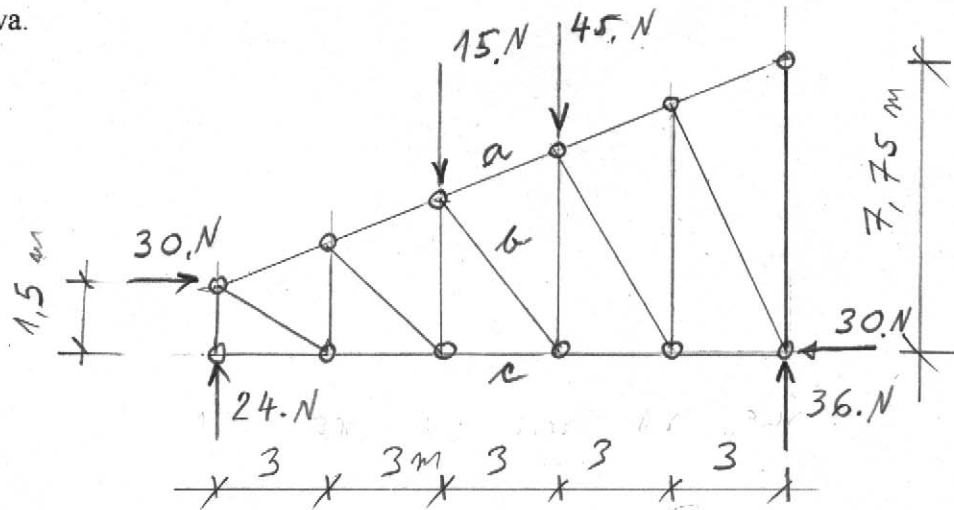
2. Treba računski potpuno riješiti prikazani ravninski sustav (statička shema, postupak, stvarna djelovanja, kontrole)



3. Treba računski potpuno riješiti prikazani ravninski sustav (statička shema, postupak, stvarna djelovanja, kontrole)

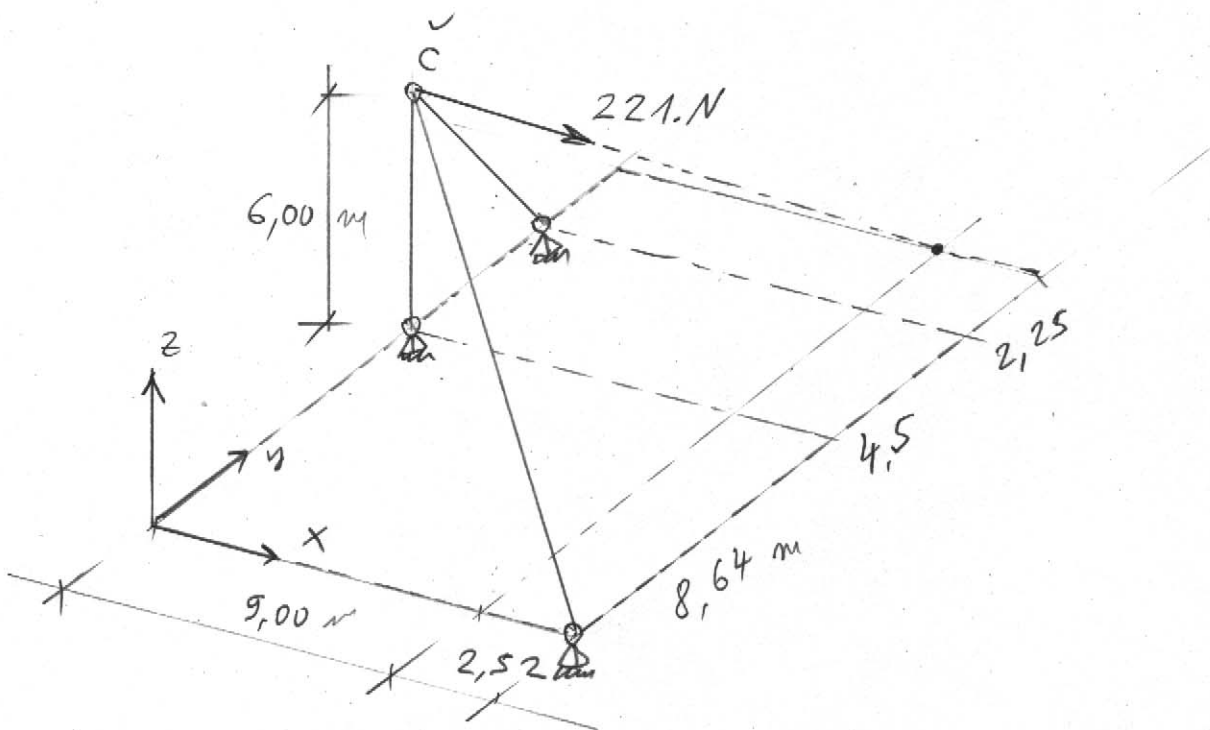


4. Prikazana je ravninska rešetka koja se nalazi u ravnoteži. Treba isključivo metodom presjeka odrediti sile u označenim štapovima i to zasebno promatranjem lijevog i zasebno promatranjem desnog dijela. Skicirati stvarana djelovanja i iskazati smisao sile (TLAK ili VLAK) za svaki od promatranih štapova.



SILE: A, B, C

5. Treba računski potpuno riješiti prikazani prostorni sustav (statička shema, postupak, stvarna djelovanja, kontrole)

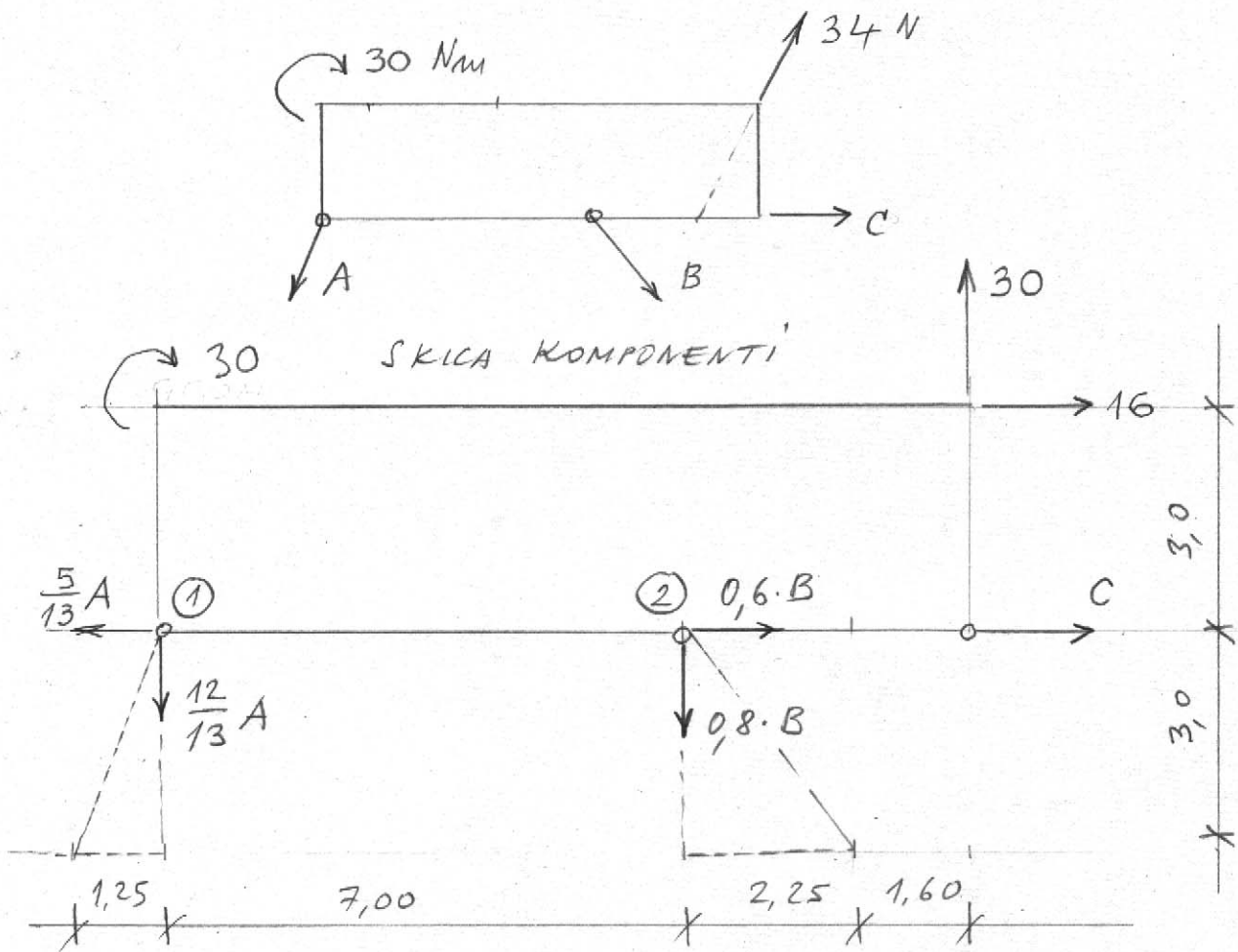


OVAJ LIST SMIJE SE KORISTITI SAMO ZA POMOĆNE PRORAČUNE I GRAFIČKI POSTUPAK.

NA DODANIM LISTOVIMA MORA SE NALAZITI: STATIČKA SHEMA, PRIKAZ STVARNIH DJELOVANJA, TE NAPOMENA DA SE DIO POSTUPKA NALAZI NA OVOM LISTU.

HW 06/15

1) STATIČKA SCHEMA [2]



$$\sum M(2) = \phi;$$

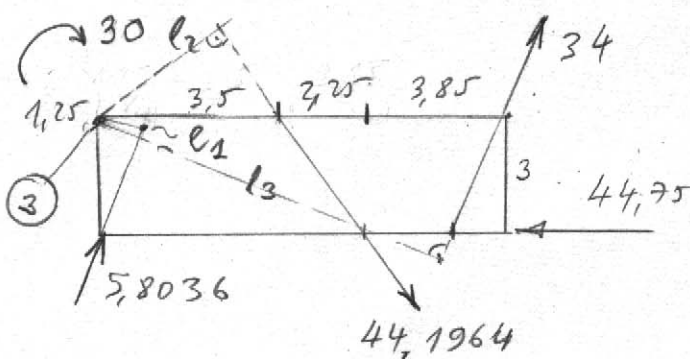
$$7 \cdot \frac{12}{13} \cdot A + 3,85 \cdot 30 - 3 \cdot 16 - 30 = \phi; \quad A = -5,8036 \text{ N} \quad [4]$$

$$\sum M(1) = \phi;$$

$$-7 \cdot 0,8 \cdot B + 10,85 \cdot 30 - 30 - 3 \cdot 16 = \phi; \quad B = +44,1964 \text{ N} \quad [4]$$

$$\sum F_{xi} = \phi; \quad -\frac{5}{13} A + 0,6 \cdot B + 16 + C = \phi; \quad C = -44,7500 \text{ N} \quad [4]$$

STVARNA DJELOVANJA [2]



l_i SE MOGU I OČITATI.

KONTROLA

$$l_1 = 1,1538$$

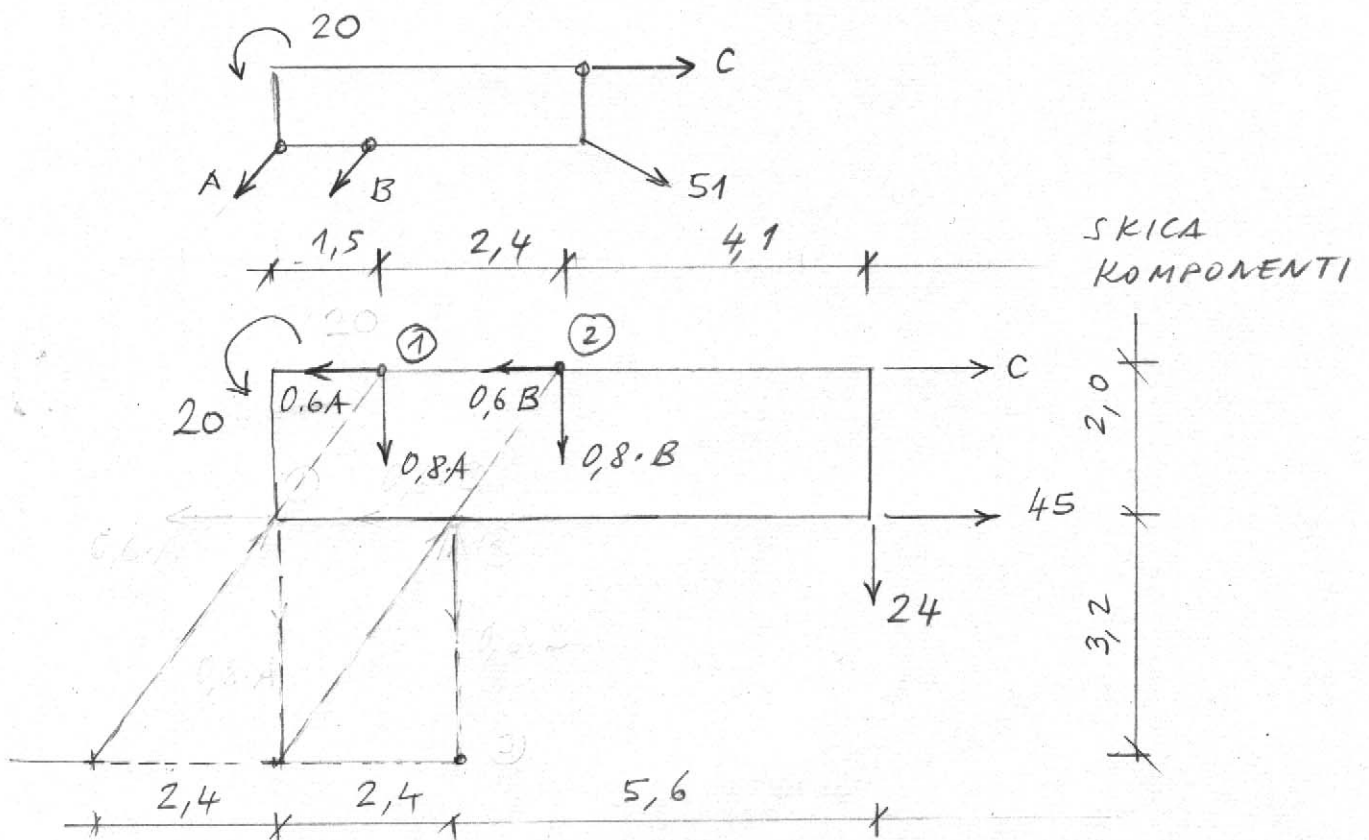
$$l_2 = 3,8$$

$$l_3 = 9,5735$$

$$\begin{aligned} \sum M(3) &= 1,1538 \cdot 5,8036 \\ &- 30 - 3,8 \cdot 44,1964 + \\ &+ 9,5735 \cdot 34 - 3 \cdot 44,75 = \\ &= -0,0011 \quad [4] \end{aligned}$$

UKUPNO 20

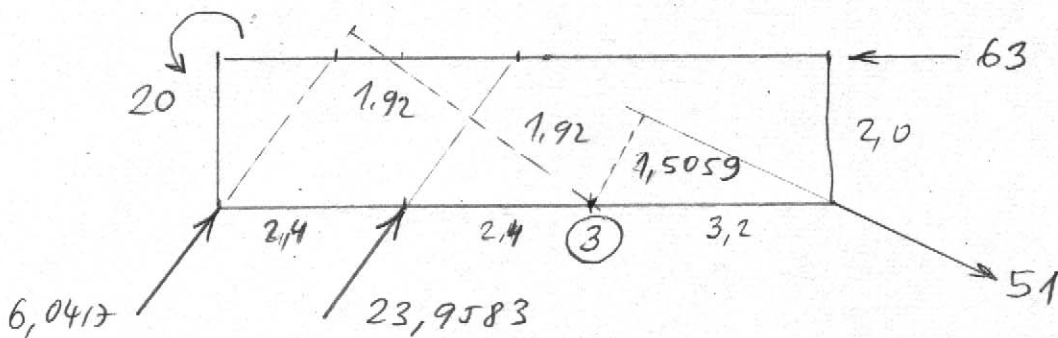
2) STATIČKA SCHEMA [2]



$$\begin{aligned} \sum M_{(2)} = 0; & \quad 2,4 \cdot 0,8 \cdot A + 20 + 2,4 \cdot 45 - 4,1 \cdot 24 = 0; \quad A = -6,0417 \text{ N} \\ \sum M_{(1)} = 0; & \quad -2,4 \cdot 0,8 \cdot B + 20 + 2 \cdot 45 - 6,5 \cdot 24 = 0; \quad B = -23,9583 \text{ N} \\ \sum F_{xi} = 0; & \quad -0,6 \cdot A - 0,6 \cdot B + 45 + C = 0; \quad C = -63,0000 \text{ N} \end{aligned}$$

3 x [4]

STVARNA DJELOVANJA [2]

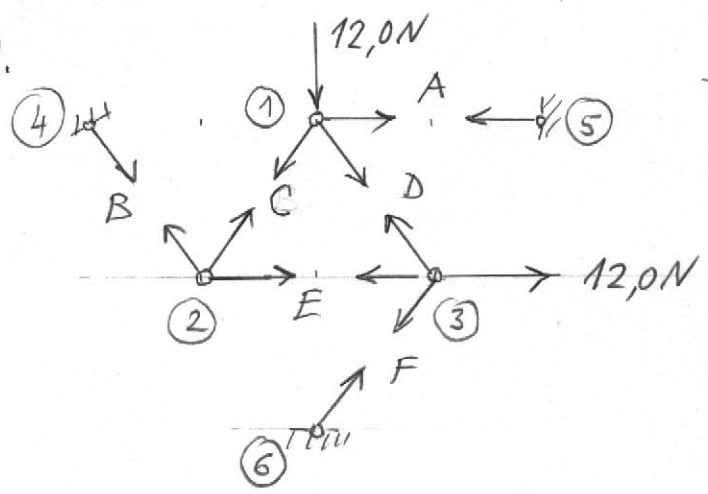


KONTROLA

$$\begin{aligned} \sum M_{(3)} = & \quad 20 - 3,84 \cdot 6,0417 - 1,92 \cdot 23,9583 - \\ & + 2,0 \cdot 63 - 1,5059 \cdot 51 = -0,00096 \checkmark \end{aligned}$$

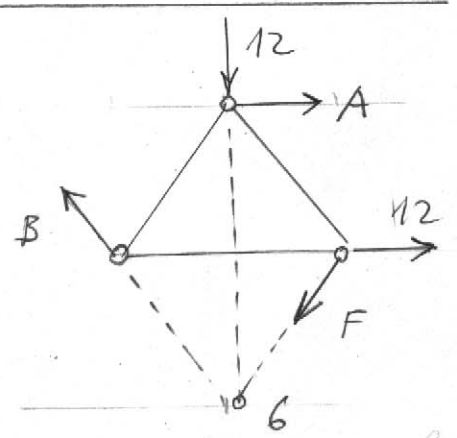
[4]

3).

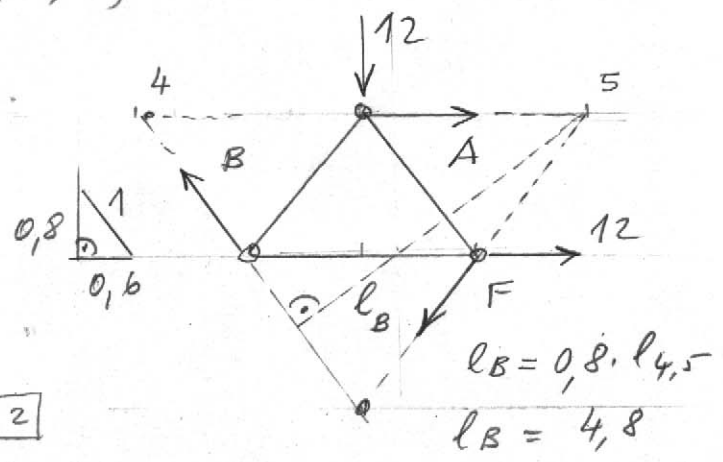


STATIČKA SCHEMA [2]

RAVNOTEŽA REŠETKE (1, 2, 3)



[2]



$l_B = 0,8 \cdot 4,5$
 $l_B = 4,8$

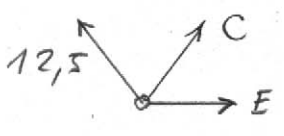
$\sum M(6) = 0; A = -\frac{2 \cdot 12}{4} = -6,0 N$

$\sum M(5) = \phi$

UZ POZNATI A, REŠETKA SE MOŽE RIJEŠITI ČVOR PO ČVOR, ALI SE ANALOGNO MOGU ODREDITI F I B (GORE).

$B = \frac{1}{4,8} (3 \cdot 12 + 2 \cdot 12) = 12,5$ [2]

ČVOR 2



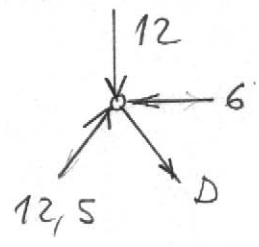
$\sum F_{xi} = \phi; C = -12,5 N$ [2]

$\sum F_{yi} = \phi$

$E = 0,6 [12,5 - (-12,5)]$

$E = 15,0 N$ [2]

ČVOR 1



$\sum F_{yi} = \phi$

$D = \frac{1}{0,8} (0,8 \cdot 12,5 - 12) = -2,5 N$ [2]

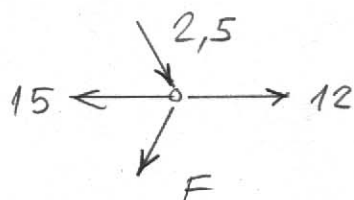
KONTROLA $\sum F_{xi} = 12,5 \cdot 0,6 - 6 + (-2,5) \cdot 0,6 = 0 \checkmark$ [1]

$12 - F - 0,6(D + F) = \phi$

$\sum F_{yi} =$

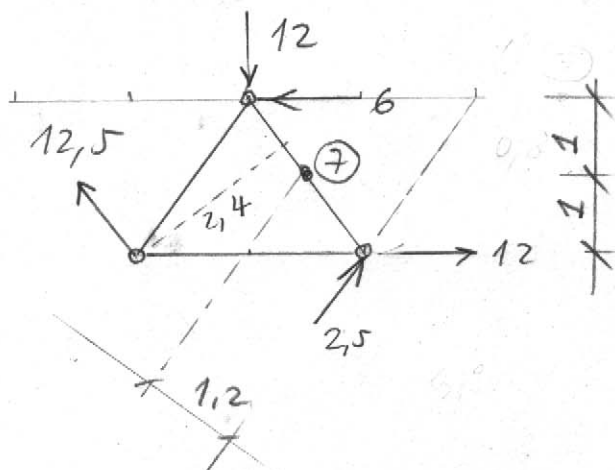
ČVOR 3

$$\sum F_{yi} = \phi \quad F = \frac{1}{0,8} (-0,8 \cdot 2,5) = -2,5 \quad \boxed{2}$$



KONTROLA $\sum F_{xi} =$
 $-15 + 12 + 0,6(2,5 + 2,5) = \phi \quad \boxed{1}$

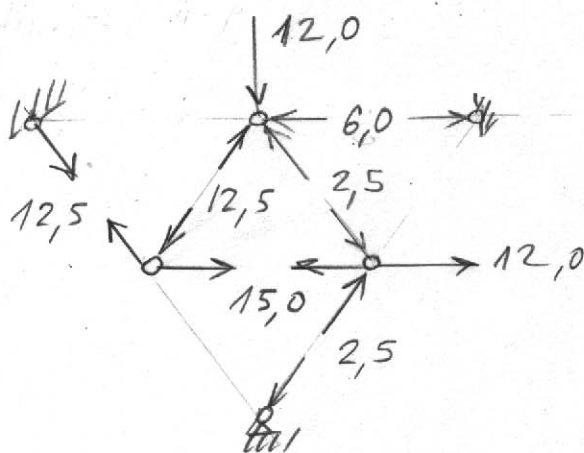
KAKO NISU ISKORIŠTENI SVI UVJETI RAVNOSTEŽE REŠETKE (1,2,3) IMA SMISLA POSTAVITI JOŠ I KONTROLU $\sum M$ NA POGODNU TOČKU (7)



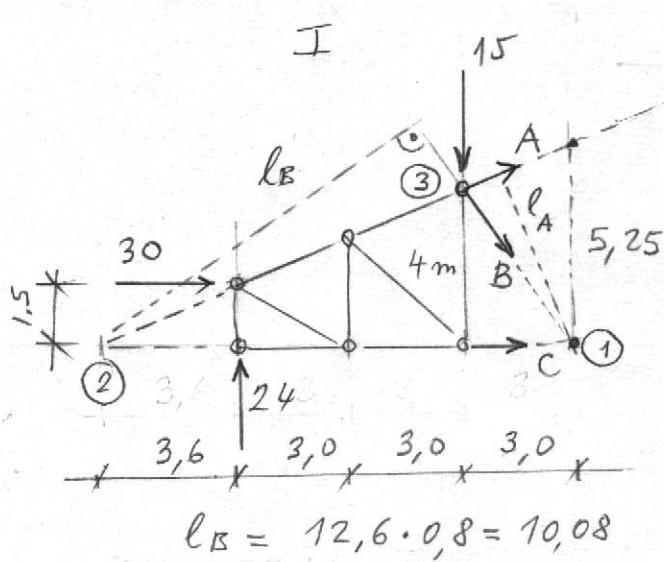
$$\sum M(7) =$$

$$0,75 \cdot 12 + 1 \cdot 6 - 2,4 \cdot 12,5 + 1,2 \cdot 2,5 + 1 \cdot 12 = 0 \quad \boxed{2}$$

STVARNA DJELOVANJA $\boxed{2}$



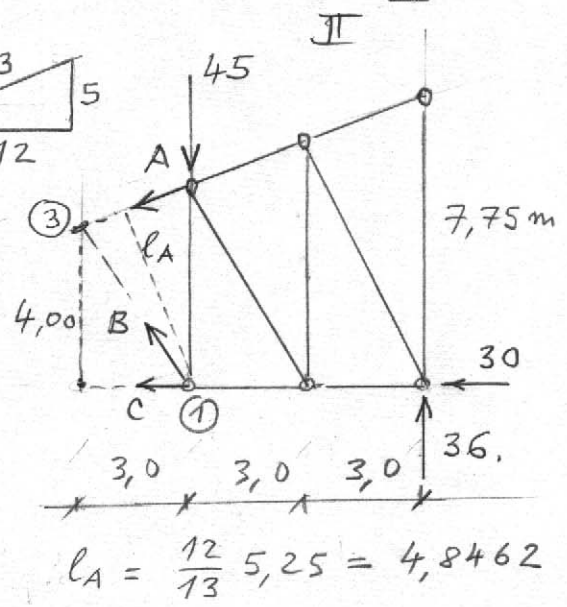
4) STATIČKA SCHEMA I GEOMETRIJSKI ODNOSI [2]



$l_B = 12,6 \cdot 0,8 = 10,08$

RAVNOTEŽA I

$\sum M_{(1)} = \phi;$
 $A = \frac{1}{4,8462} (+3 \cdot 15 - 1,5 \cdot 30 - 9 \cdot 24)$
 $A = -44,5710$ [2]
 $\sum M_{(2)} = \phi;$
 $B = \frac{1}{10,08} (3,6 \cdot 24 - 1,5 \cdot 30 - 9,6 \cdot 15)$
 $B = -10,1786$ [2]
 $\sum M_{(3)} = \phi;$
 $C = \frac{1}{4} (6 \cdot 24 - 2,5 \cdot 30) = 17,25$ [2]

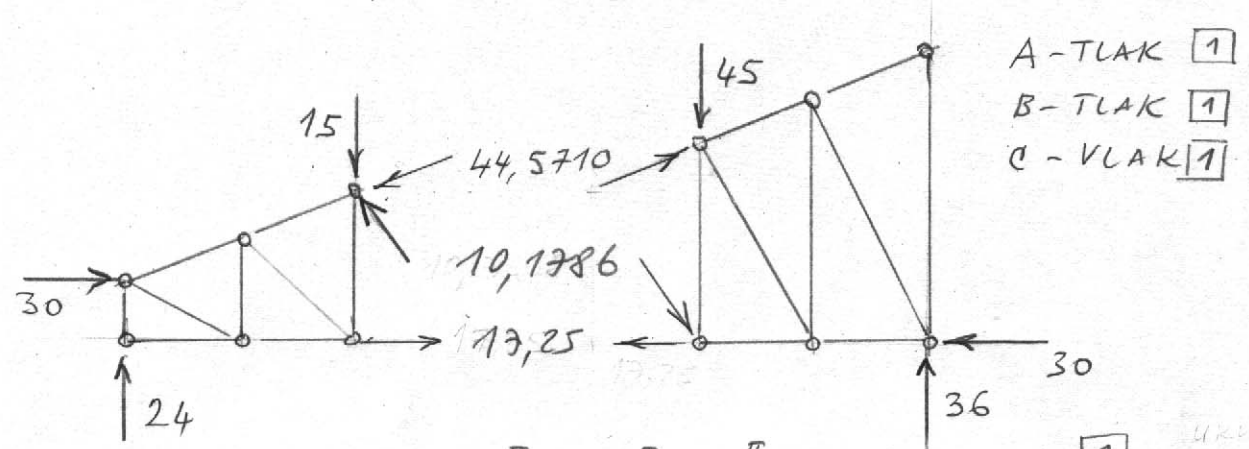


$l_A = \frac{12}{13} 5,25 = 4,8462$

RAVNOTEŽA II

$\sum M_{(1)} = \phi.$
 $A = \frac{1}{4,8462} (-6 \cdot 36) = -44,5710$ [2]
 $\sum M_{(3)} = \phi.$
 $C = \frac{1}{4} (9 \cdot 36 - 3 \cdot 45 - 4 \cdot 30)$
 $C = 17,25$ [2]
 B SE I OVAJE MOŽE ODREDITI IZ $\sum M_{(2)} = \phi.$
 MOGUĆE JE KORISTITI:
 $\sum F_{yi} = \phi$ [2]
 $B = \frac{1}{0,8} (45 + \frac{5}{13} A - 36) = -10,1786$

STVARNA DJELOVANJA [2]

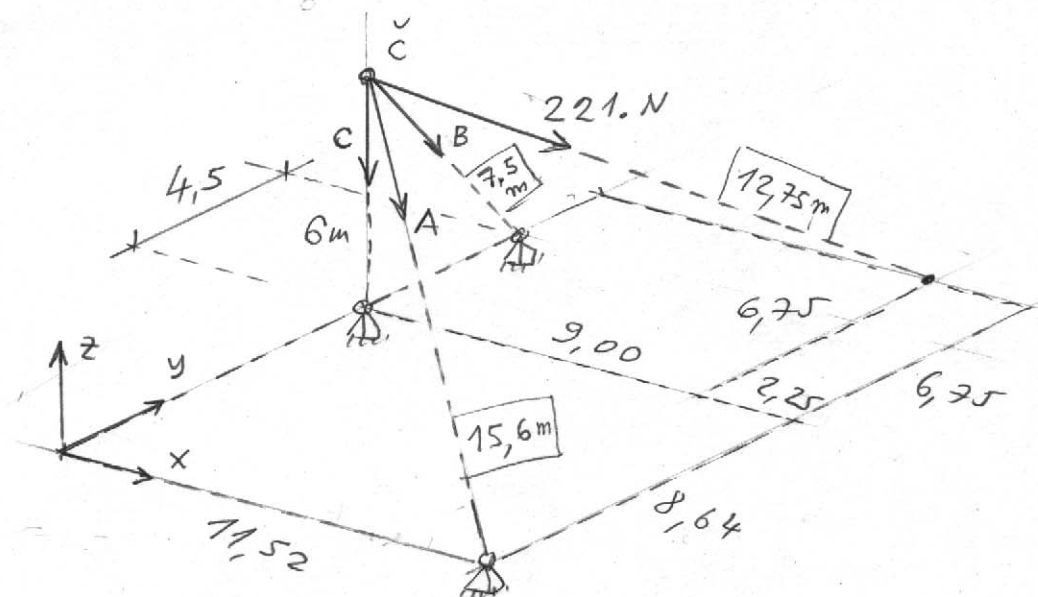


- A - TLAK [1]
- B - TLAK [1]
- C - VLAK [1]

AKO $A^I = A^{II}$ i $B^I = B^{II}$ i $C^I = C^{II}$ DODATNO [1]

UKUPNO	20
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5) STATIČKA SCHEMA I GEOMETRIJSKI ODNOSI 2

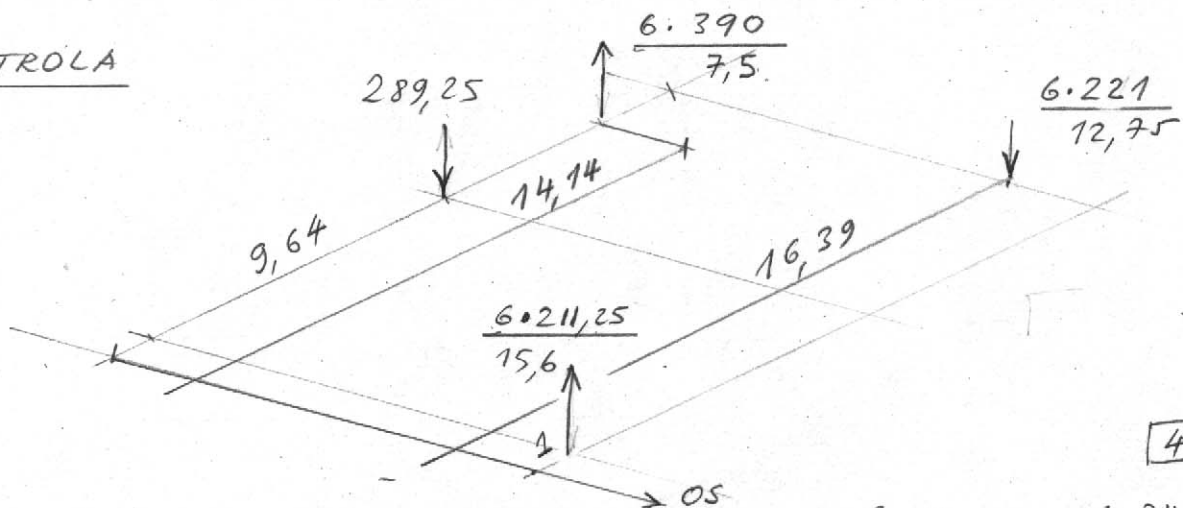


$$\sum F_{xi} = \phi; \quad \frac{11,52}{15,6} A + \frac{9,00}{12,75} \cdot 221 = \phi; \quad A = -211,25 \text{ N} \quad \boxed{4}$$

$$\sum F_{yi} = \phi; \quad -\frac{8,64}{15,6} A + \frac{4,5}{7,5} B + \frac{6,75}{12,75} \cdot 221 = \phi; \quad B = -390,00 \text{ N} \quad \boxed{4}$$

$$\sum F_{zi} = \phi; \quad -\frac{6}{15,6} A - \frac{6,0}{7,5} B - C - \frac{6 \cdot 221}{12,75} = \phi; \quad C = +289,25 \text{ N} \quad \boxed{4}$$

KONTROLA



$$\sum M_{OS} = -9,64 \cdot 289,25 + 14,14 \cdot \frac{6 \cdot 390}{7,5} - 16,39 \cdot \frac{6 \cdot 211}{12,75} + 1 \cdot \frac{6 \cdot 211,25}{15,6}$$

$$\sum M_{OS} = 0,000 \checkmark$$

STVARNA DJELOVANJA 2

