UERJ – Resistência dos Materiais II – Elaine Toscano Fonseca

Prova de Grelhas e Treliças – Ensino Remoto Emergencial

Grupo: Legião Urbana

Integrantes:
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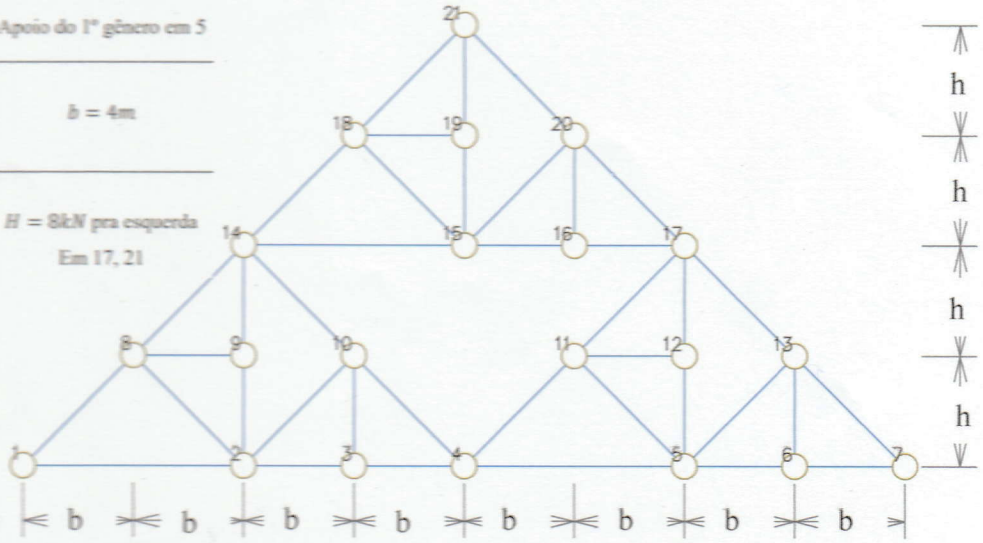
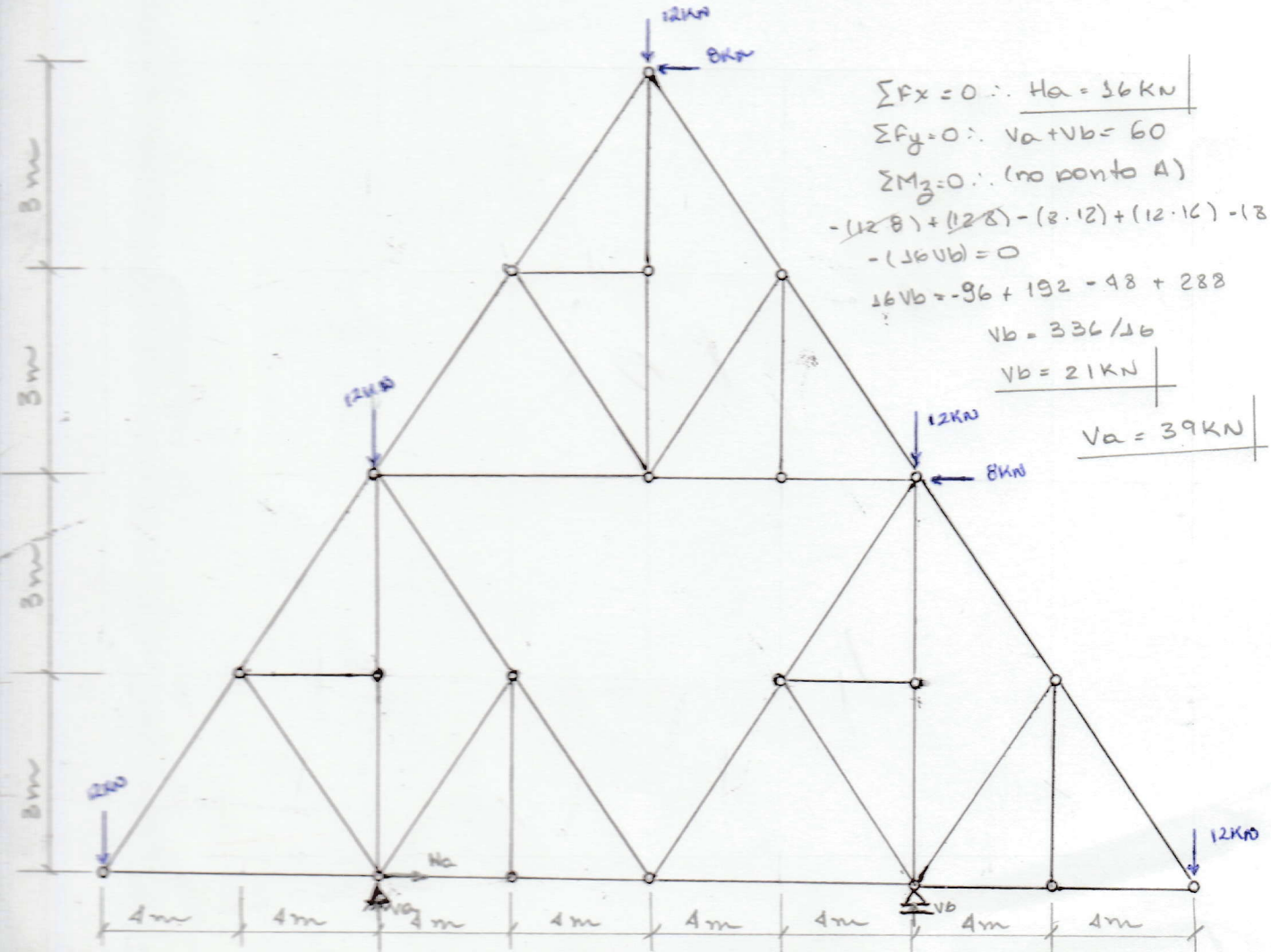
Fernanda Barreto Rodrigues – 201520766813

1 – Após aplicar os dados do seu grupo, traçar o diagrama de esforços normais da treliça abaixo, empregando qualquer método de resolução (4,0):

Apoio do 2º gênero em 2	Apoio do 1º gênero em 5
$h = 3m$	$b = 4m$
$V = 12kN$ descendo Em 1, 14, 21, 17, 7	$H = 8kN$ pra esquerda Em 17, 21





$\Sigma Fx = 0 \therefore Ha = 36\,KN$

$\Sigma Fy = 0 \therefore Va + Vb = 60$

$\Sigma M_z = 0 \therefore$ (no ponto A)

$-(12 \cdot 8) + (12 \cdot 8) - (8 \cdot 12) + (12 \cdot 16) - (8 \cdot 6) + (12 \cdot 24)$

$-(36\,Vb) = 0$

$36\,Vb = -96 + 192 - 48 + 288$

$Vb = 336/16$

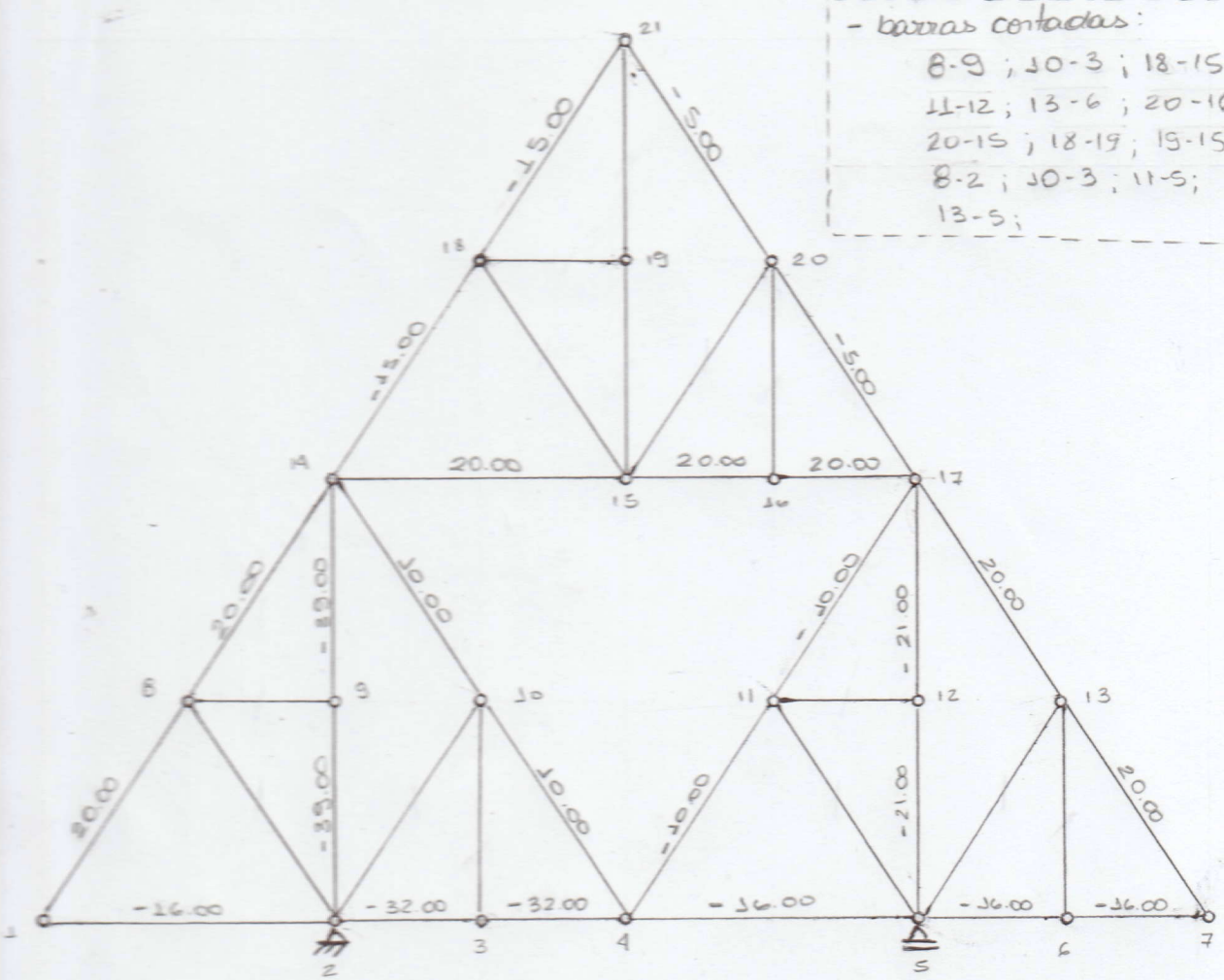
$Vb = 21\,KN$

$Va = 39\,KN$

Simplificando treliças

- barras contadas:

8-9 ; 10-3 ; 18-15,
11-12 ; 13-6 ; 20-16;
20-15 ; 18-19 ; 19-15;
8-2 ; 10-3 ; 11-5;
13-5;



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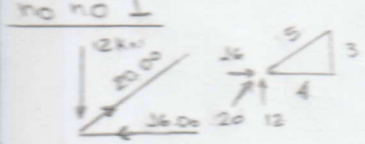

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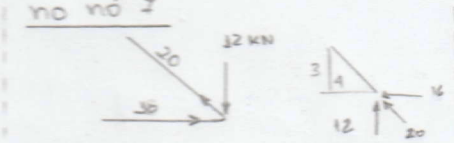

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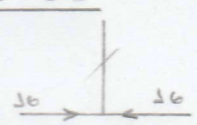

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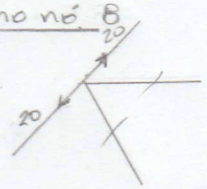

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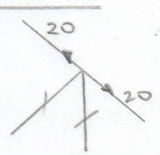

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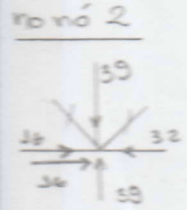

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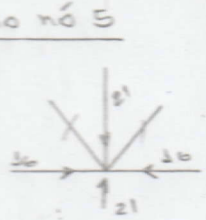

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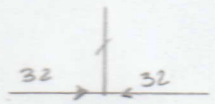

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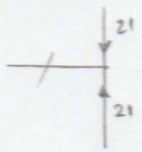

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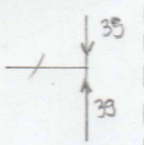

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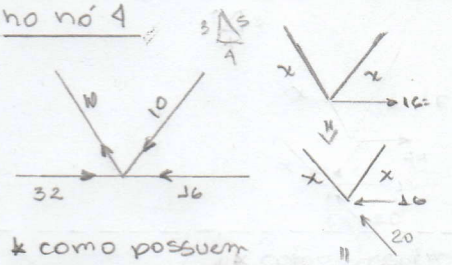

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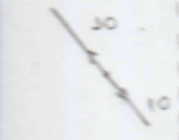

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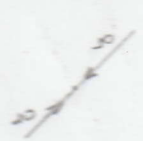

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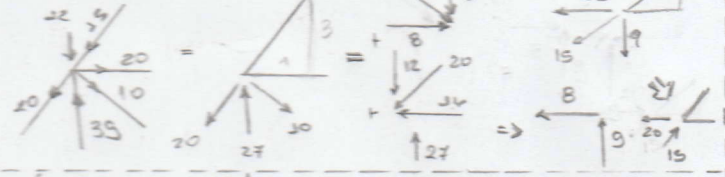
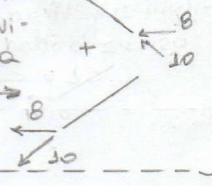


* como possuem a mesma inclinação 20 será dividido para cada barra



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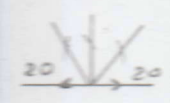

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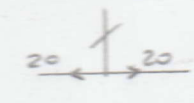

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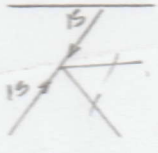

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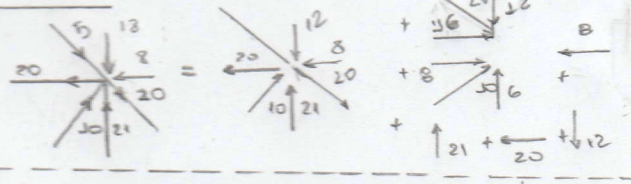

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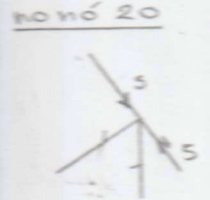
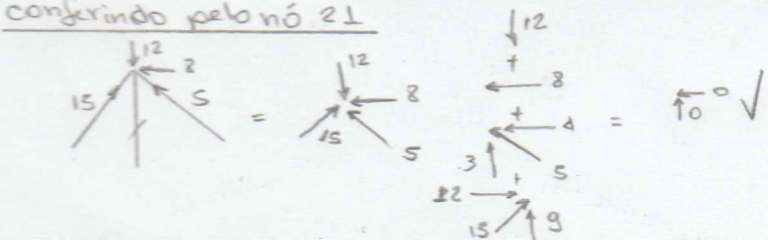
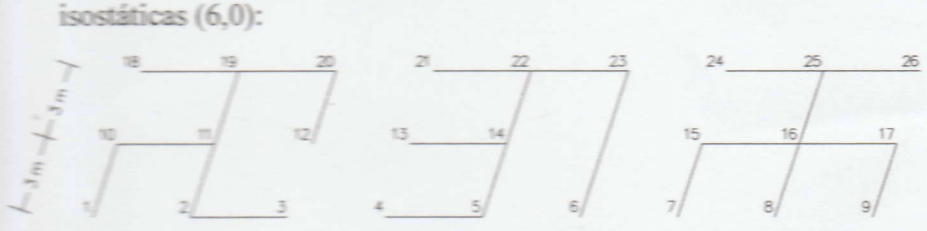


no nó 19

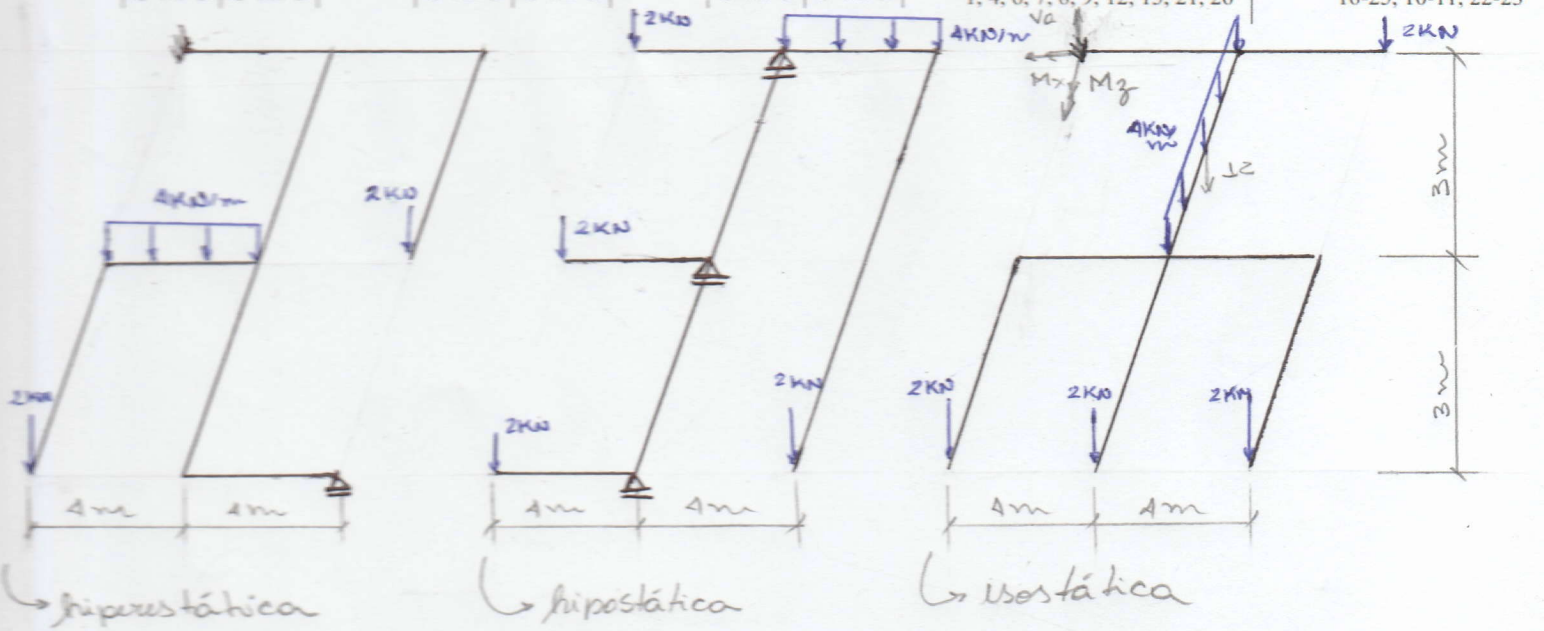
conferindo pelo nó 21



2 – Classificar as estruturas quanto à estaticidade e traçar os diagramas de esforços solicitantes para as grelhas isostáticas (6,0):



Engastes em:	Apoios em:
18, 24	3, 5, 14, 22
Vertical 2kN descendo em:	**Distribuída 4kN/m em:**
1, 4, 6, 7, 8, 9, 12, 13, 21, 26	16-25, 10-11, 22-23



↳ hiperestática ↳ hipostática ↳ isostática

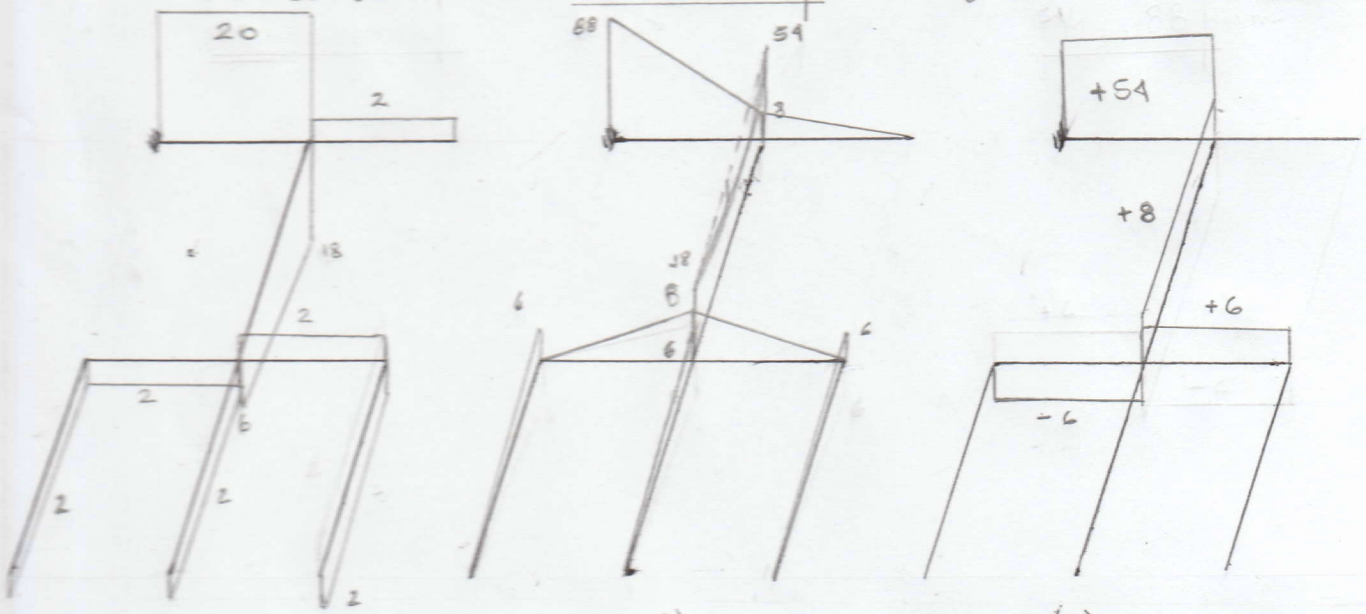
$\sum F_y = 0 \therefore Va = 20\,kN$

$\sum M_x = 0 \therefore -M_x + (12 \cdot 1,5) + (2 \cdot 6) + (2 \cdot 6) + (2 \cdot 6) = 0$

$M_x = 18 + 12 + 12 + 12 \Rightarrow M_x = 54\,kN\,m$

$\sum M_z = 0 \therefore -M_z + (2 \cdot 8) + (12 \cdot 4) + (2 \cdot 4) + (2 \cdot 8) = 0$

$M_z = 16 + 48 + 8 + 16 \Rightarrow M_z = 88\,kNm$



(Q) (M) (T)

$M_{máx} = q\frac{l^2}{8} = 4,5$

$(26x) = -(2 \times 8) + (2 \times 4) - (12 \times 4) + (20 \times 8 - 88 = 0$

$(F) = (15 - 6) = 2 \times 4 = 8$

$(25x) = Fy \cdot 4 - 88 = -8$

$(36z) = -(2 \times 3) + (2 \times 3) + (2 \times 3) = -18$

$(25z) = -(2 \times 6) + (2 \times 6) + (2 \times 6) - (12 \times 1,5) = -54$

$(17x) = (20 \cdot 8) - 88 - (12 \times 4) - (2 \times 4) - (2 \times 8) = 0$