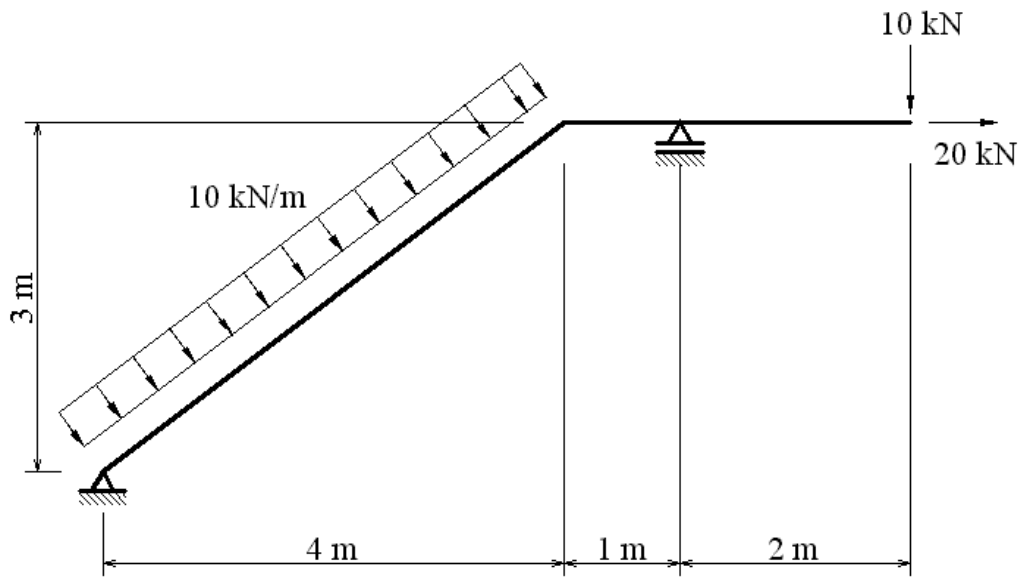


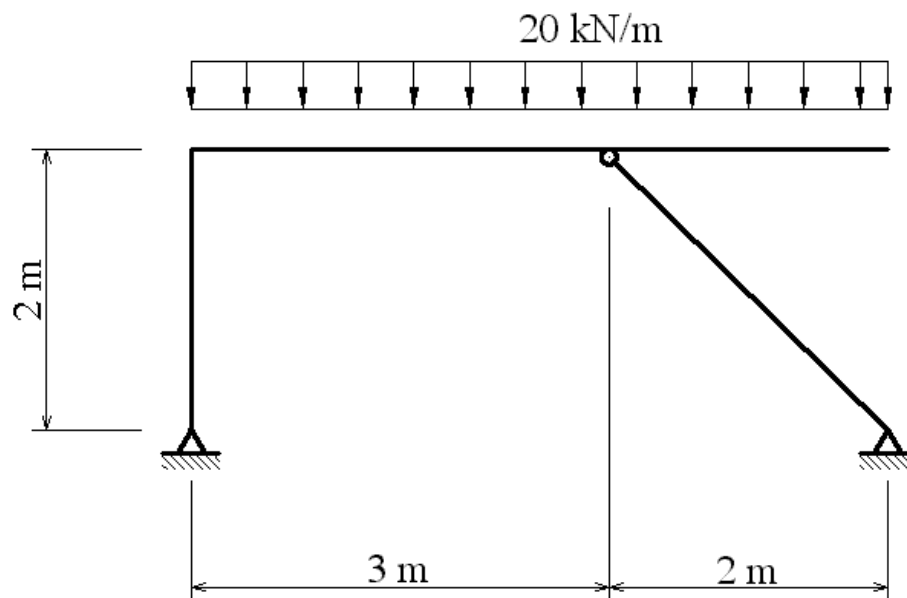
LISTA DE EXERCÍCIOS 3

1. Obter os diagramas de estado das seguintes estruturas:

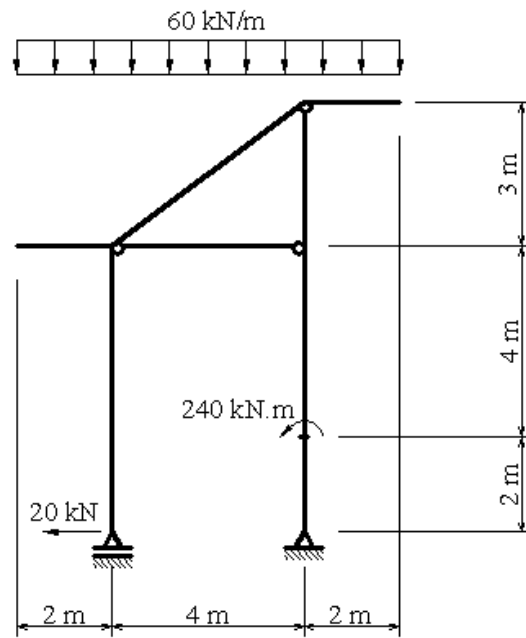
a)



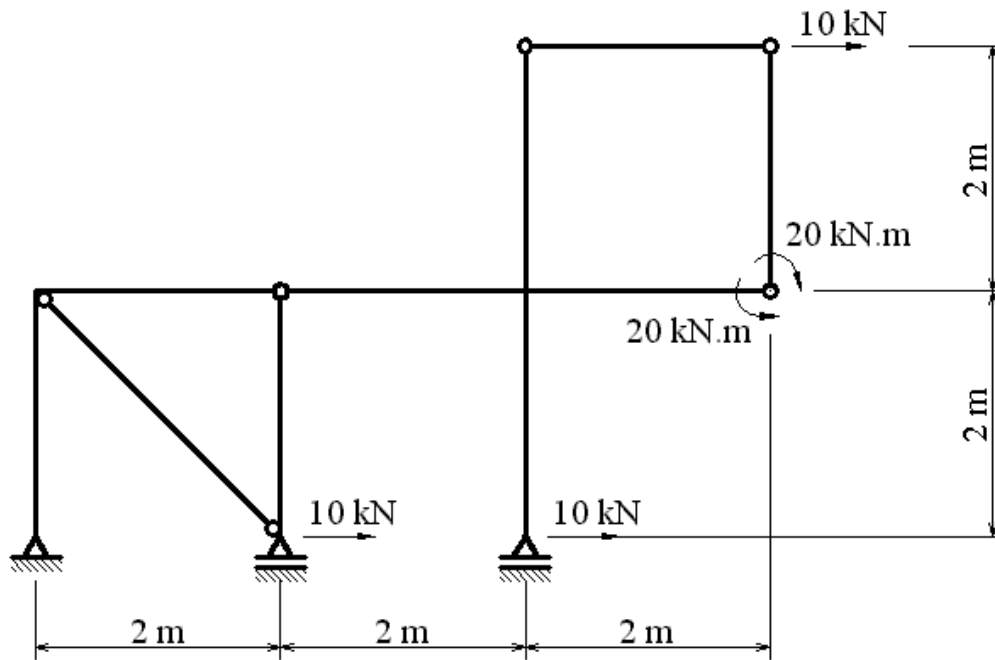
b)



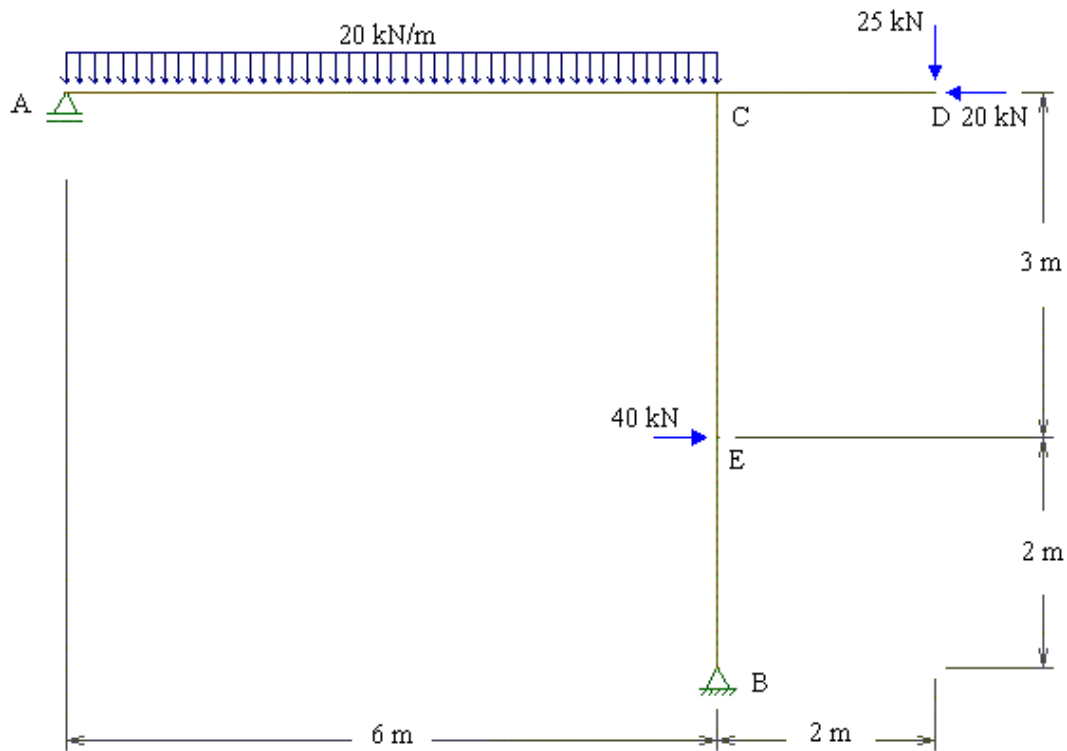
c)



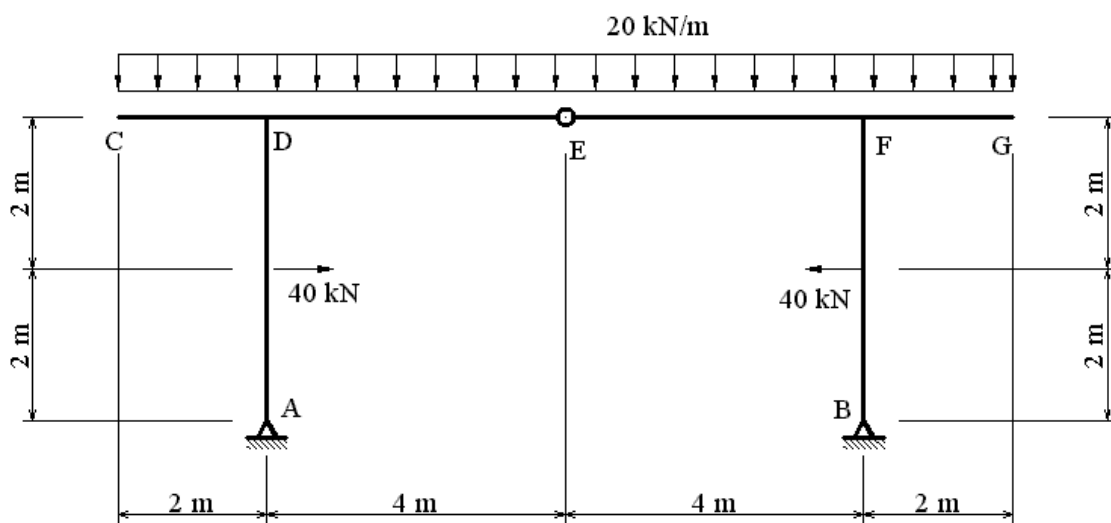
d)



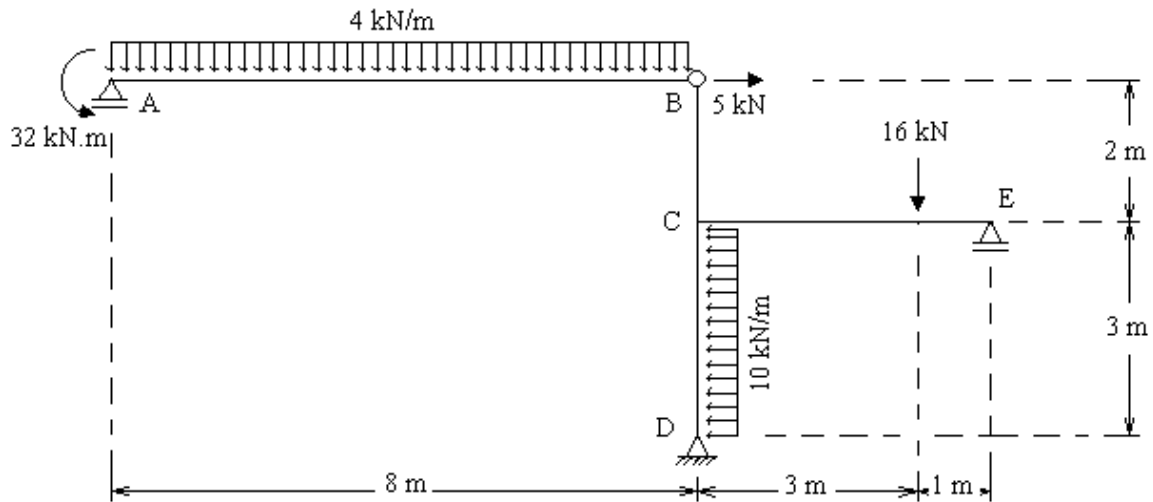
2. Obter os diagramas de momento fletor, esforço cortante e esforço normal para as barras do quadro (pórtico) abaixo.



3. Obter os diagramas de momento fletor, esforço cortante e esforço normal para as barras AD, CD e DE do quadro abaixo.

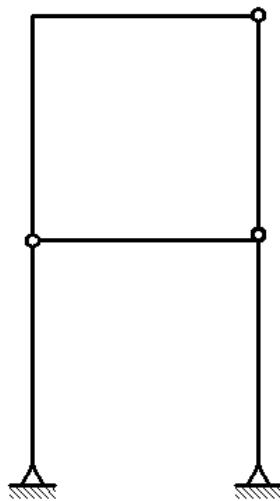


4. Uma equipe de engenheiros foi contratada para projetar uma estrutura industrial. Após o estudo das necessidades do cliente e das características da obra, a melhor alternativa, técnica e econômica, para a estrutura foi o pórtico isostático cujo modelo está representado na figura abaixo. Como parte da equipe técnica você ficou responsável por dimensionar a estrutura.
- a) Considerando as reações de apoio fornecidas, apresente os diagramas de estado do pórtico.
- b) Qual o momento máximo positivo na barra AB? Em que posição da barra ele ocorre?

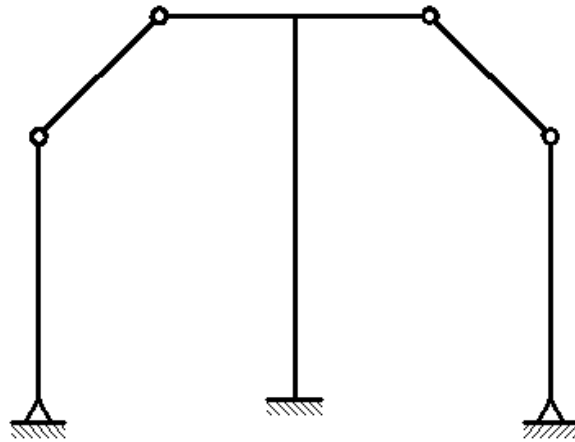


5. Decompor os quadros compostos a seguir nos quadros simples que os constituem indicando a transmissão de esforços entre eles:

a)



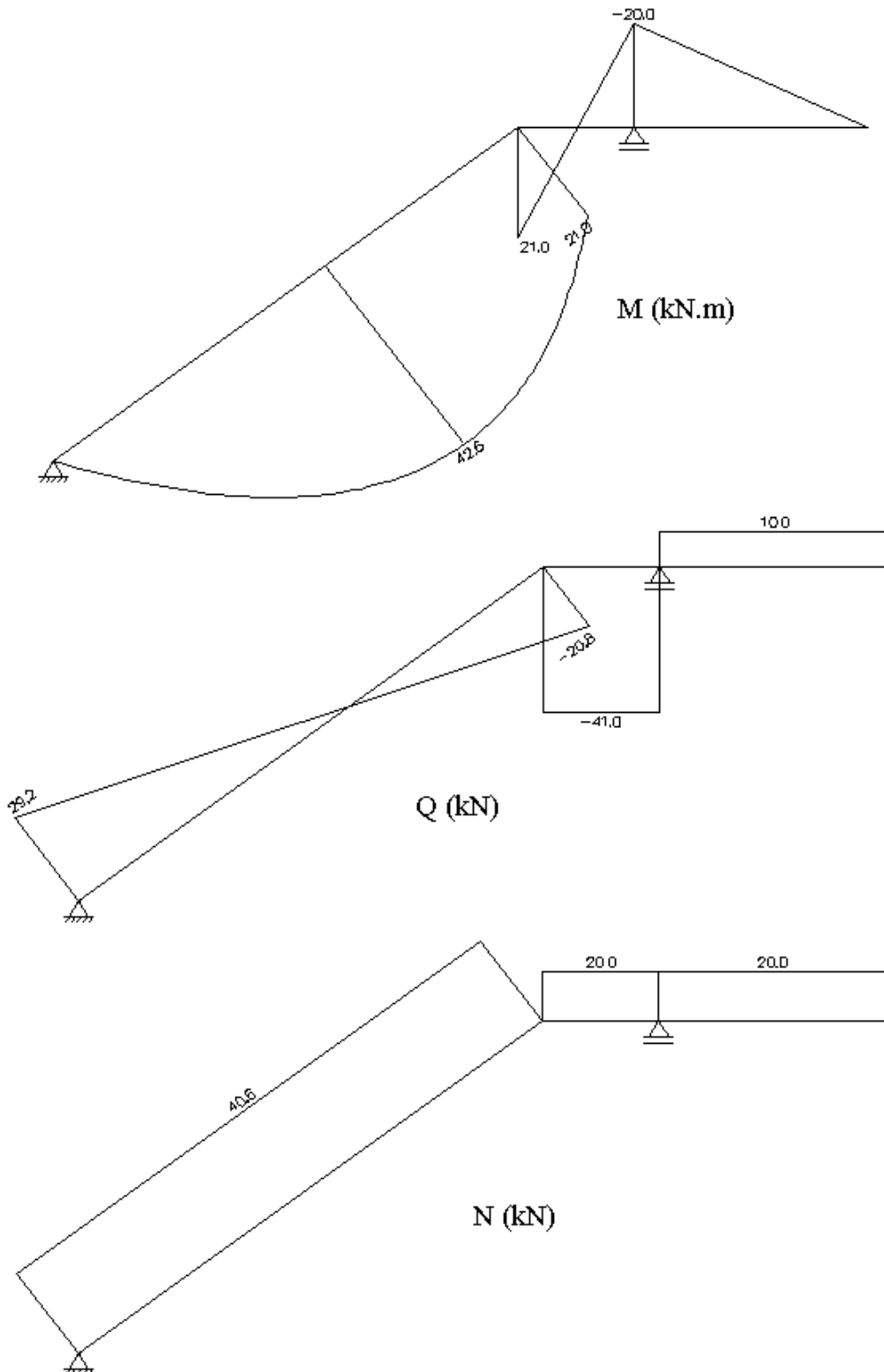
b)



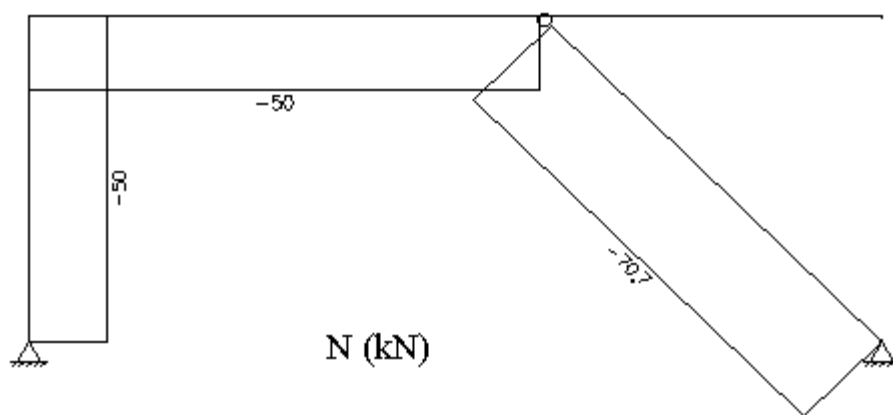
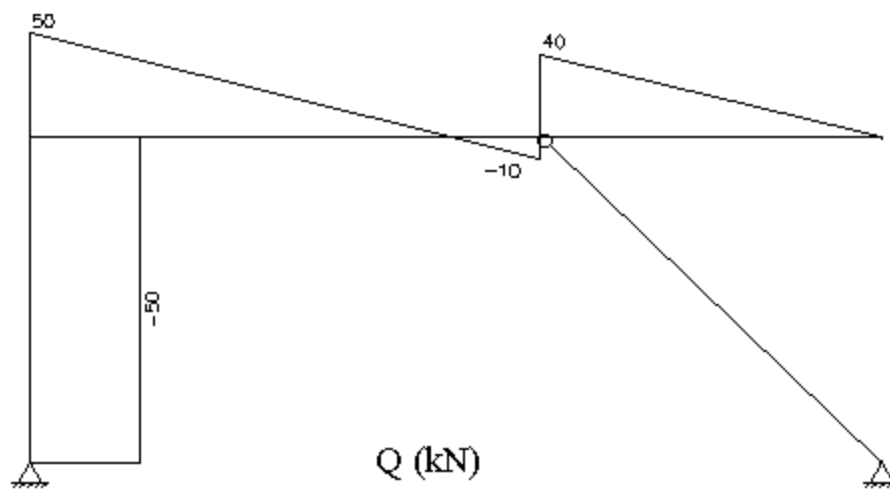
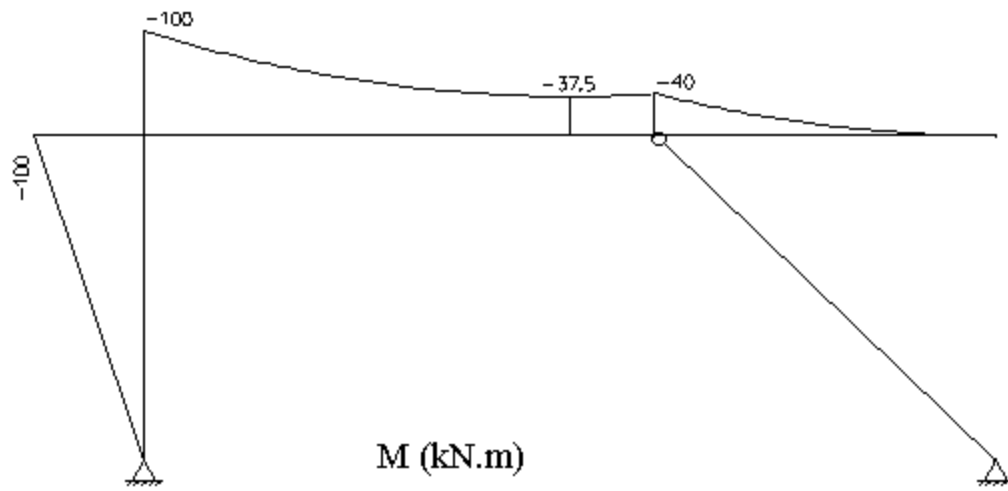
RESPOSTAS DOS EXERCÍCIOS:

1.

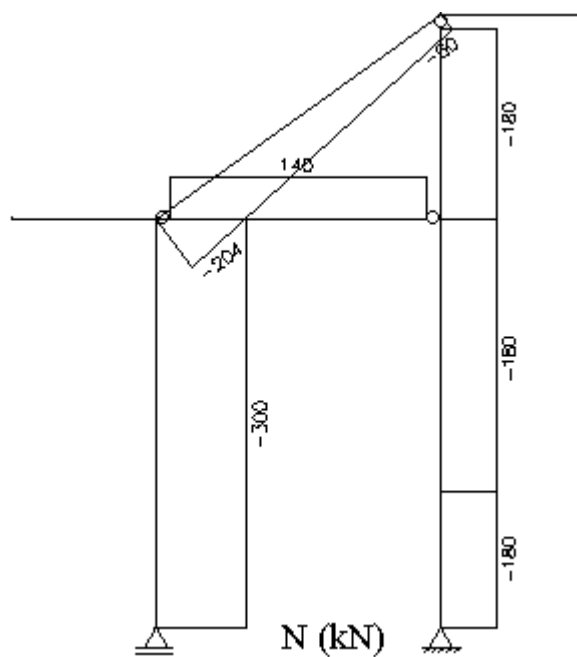
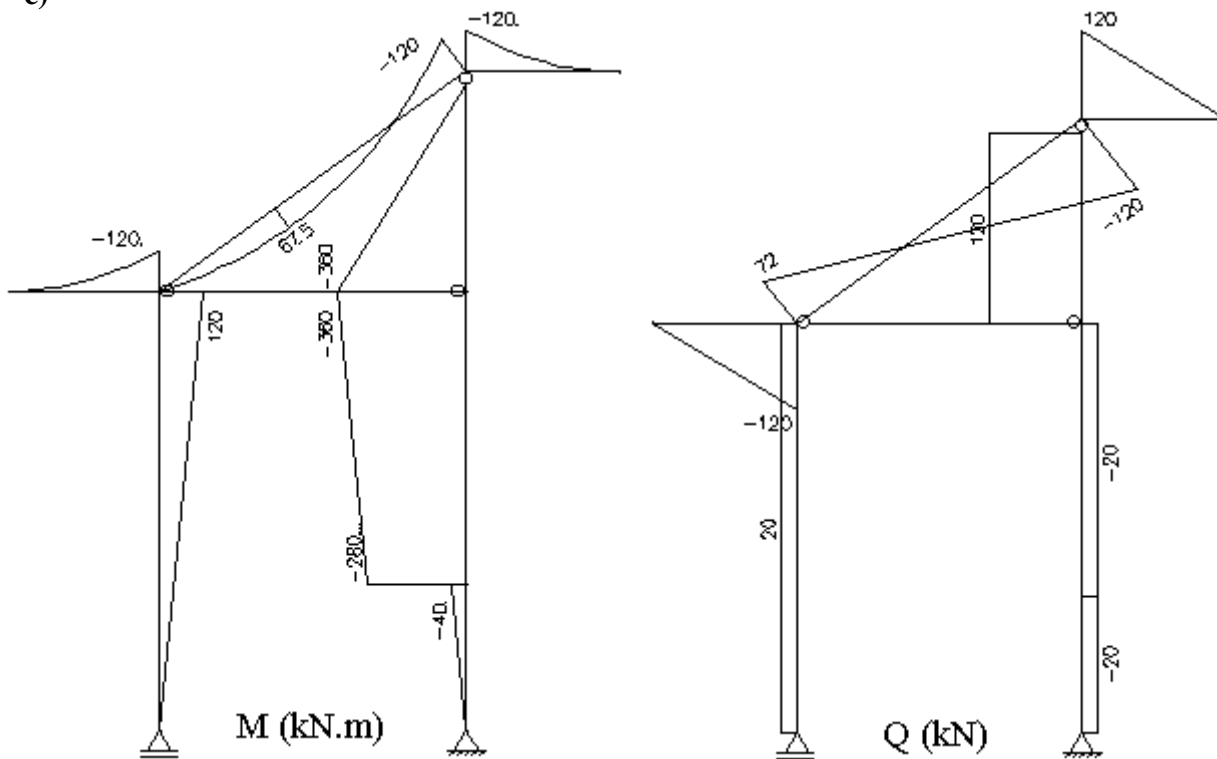
a)



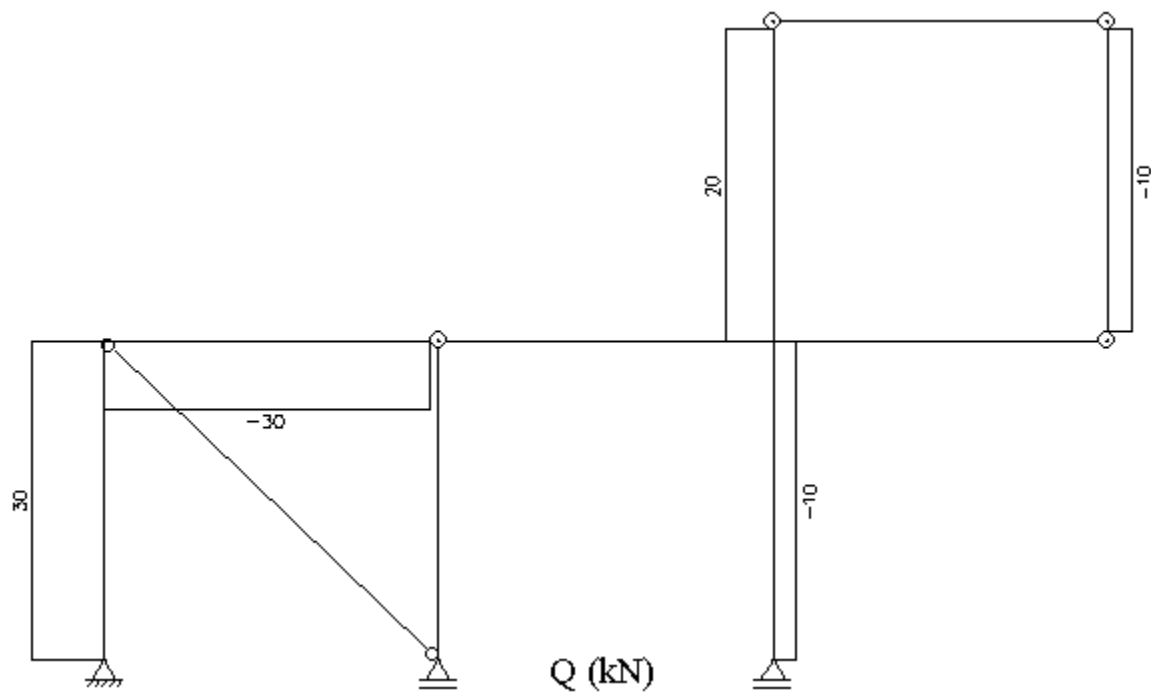
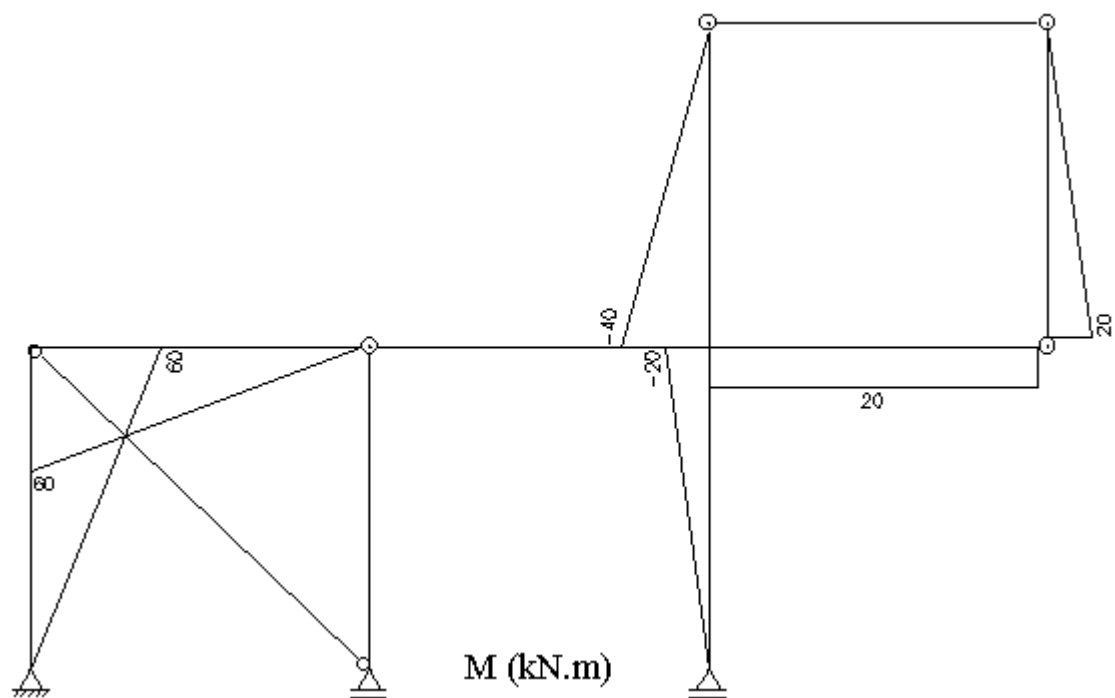
b)

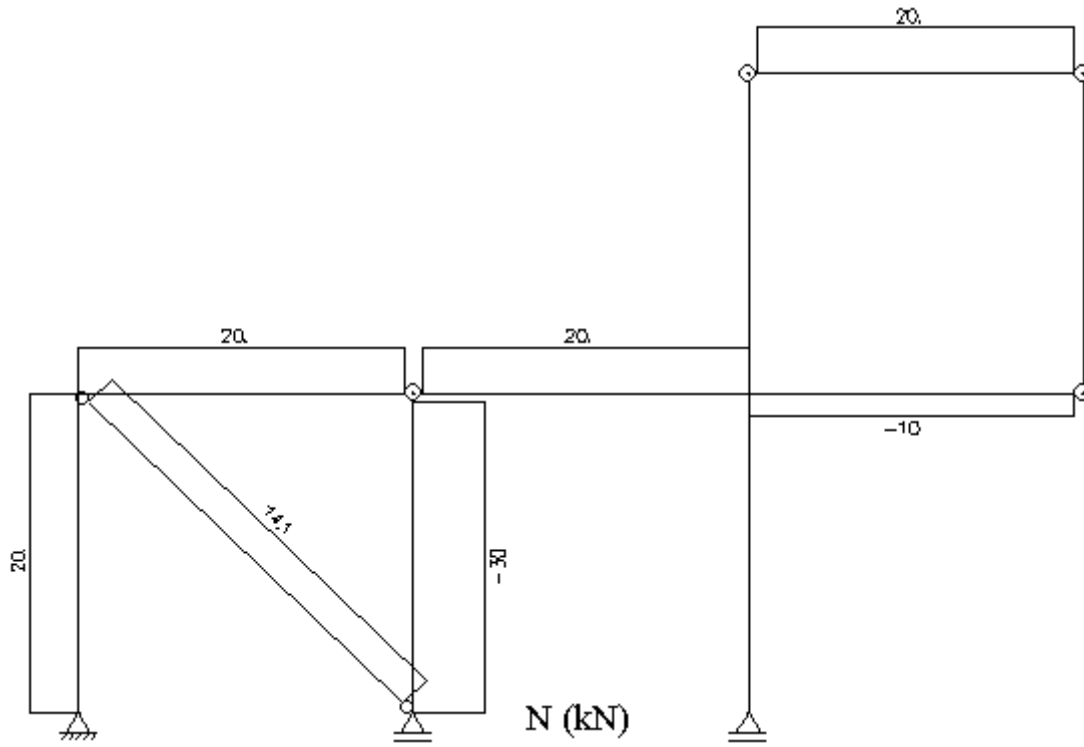


c)

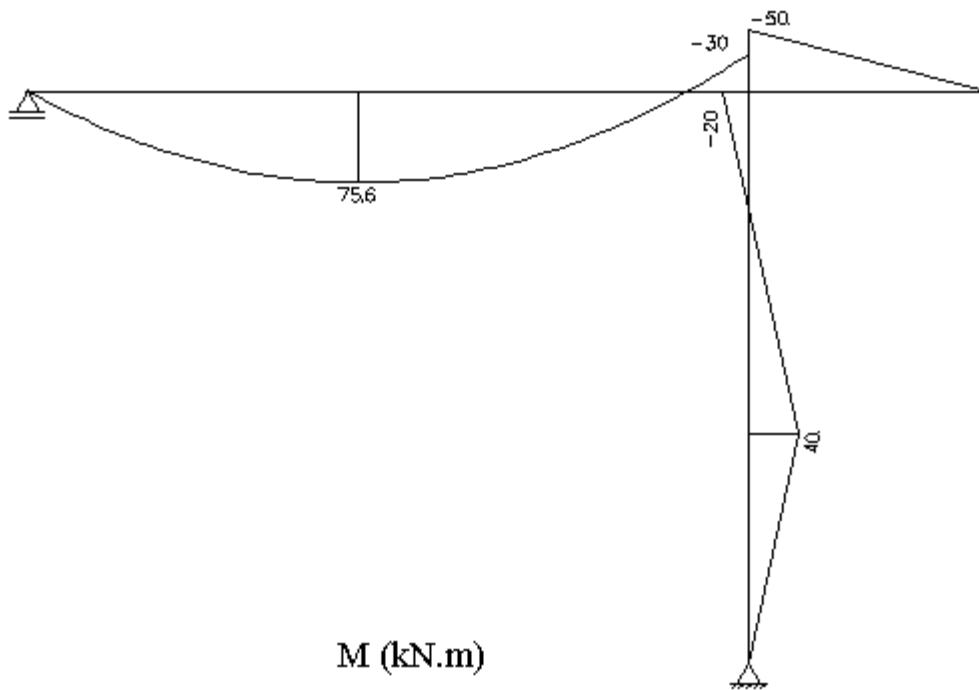


d)

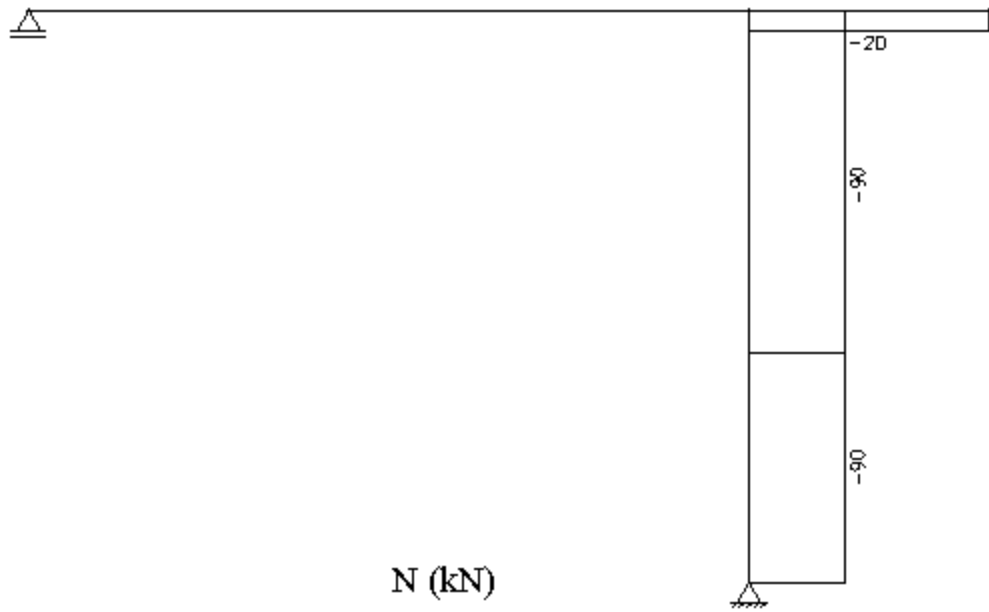
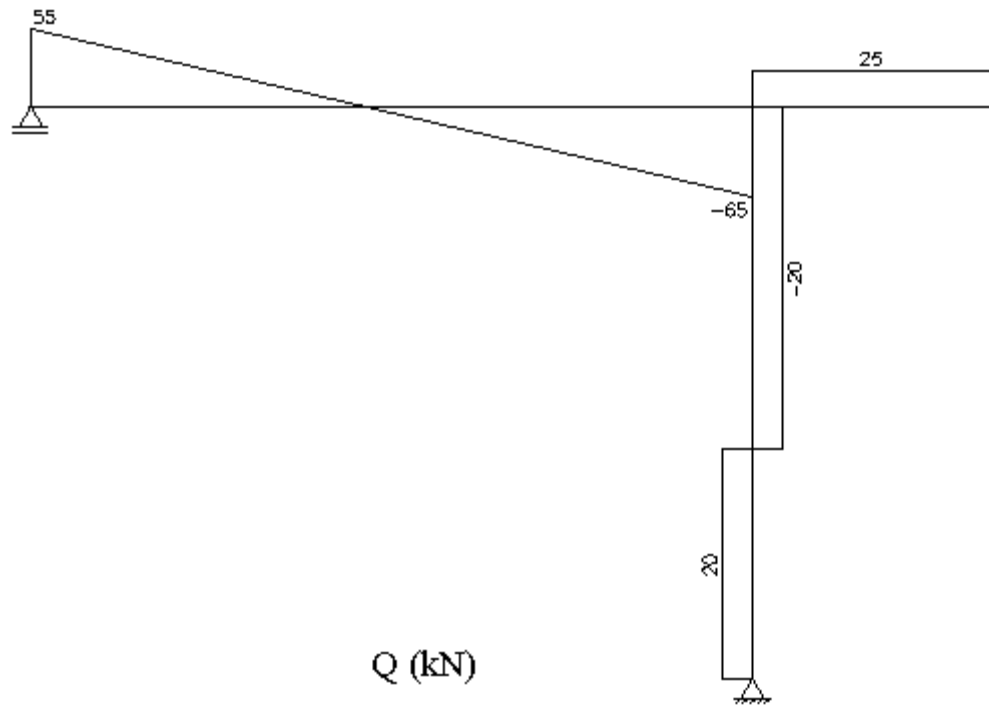




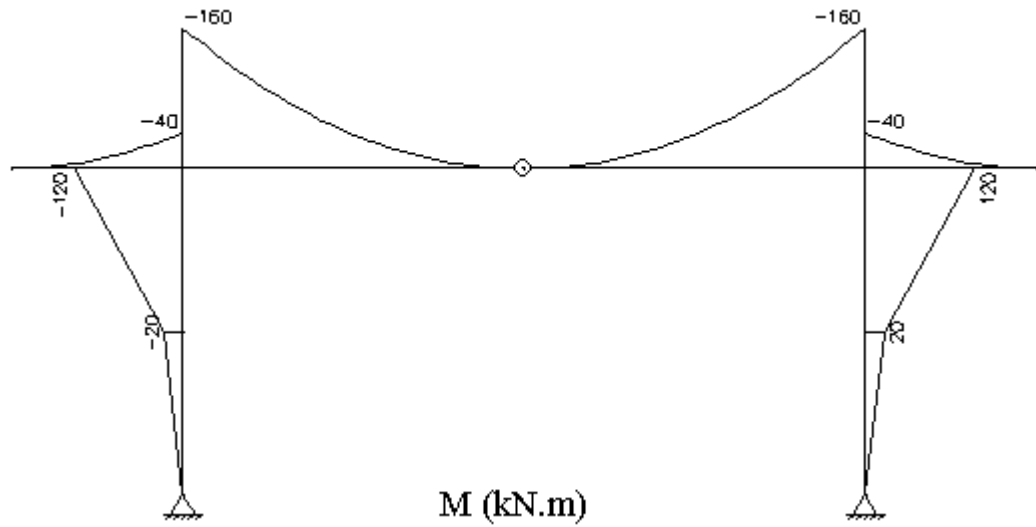
2.



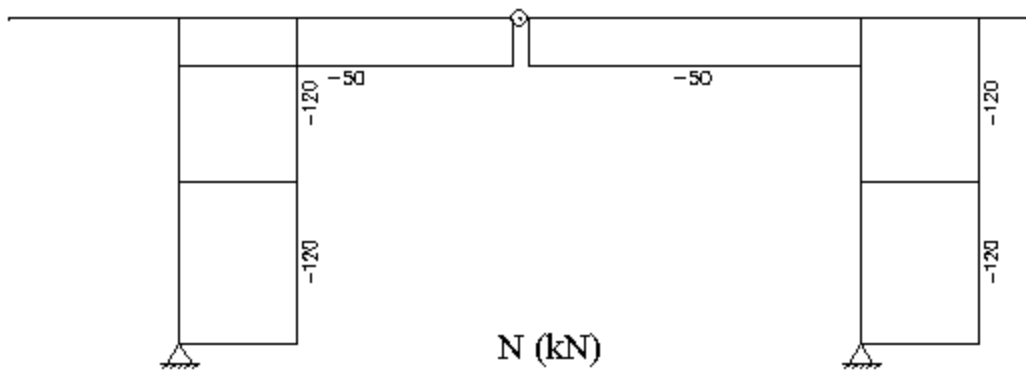
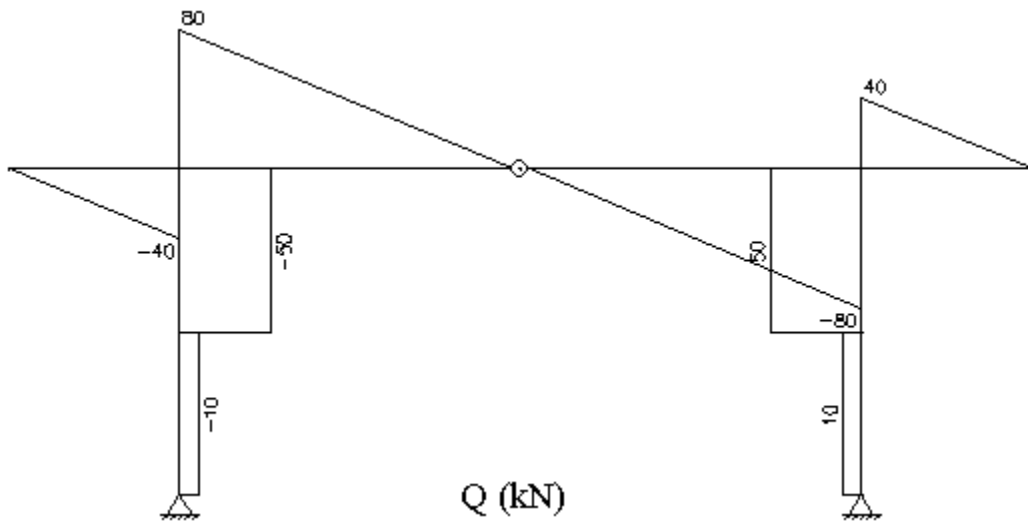
$$\begin{aligned}
 V_A &= 55\text{kN} \uparrow \\
 H_B &= 20\text{kN} \leftarrow \\
 V_B &= 90\text{kN} \uparrow
 \end{aligned}$$



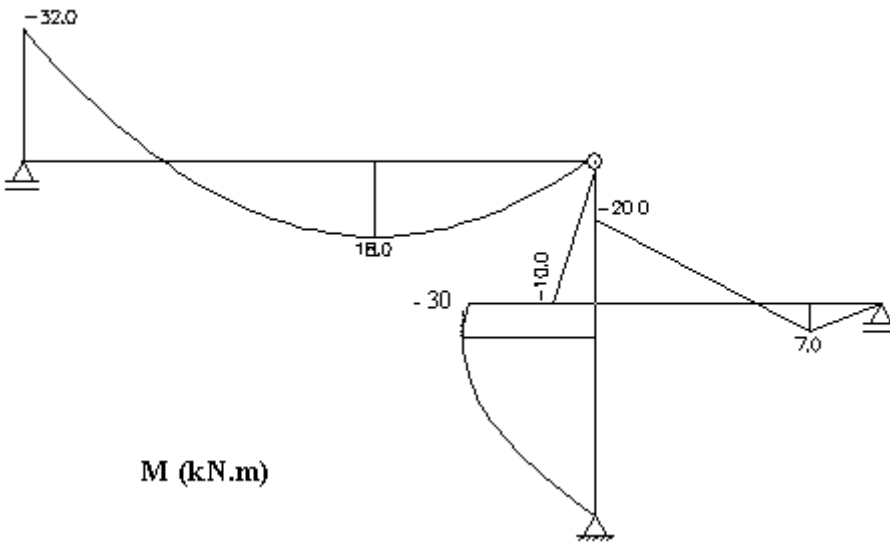
3.



$$\begin{aligned} H_A &= 10\text{kN} \rightarrow \\ V_A &= 120\text{kN} \uparrow \\ H_B &= 10\text{kN} \leftarrow \\ V_B &= 120\text{kN} \uparrow \end{aligned}$$



4. a)



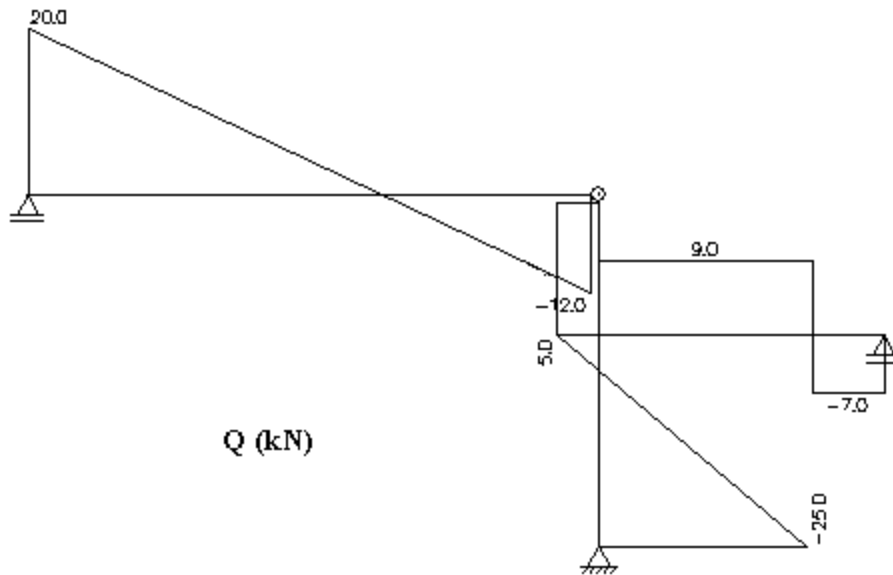
$$V_A = 20 \text{ kN} \uparrow$$

$$H_D = 25 \text{ kN} \rightarrow$$

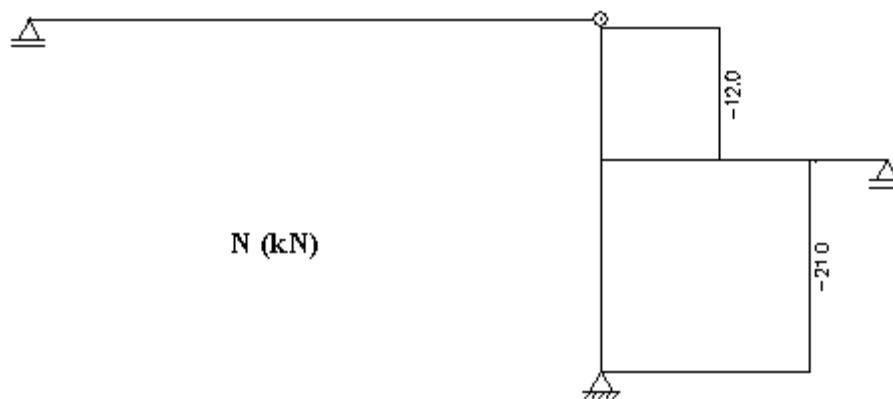
$$V_D = 21 \text{ kN} \uparrow$$

$$V_E = 7 \text{ kN} \uparrow$$

M (kN.m)



Q (kN)

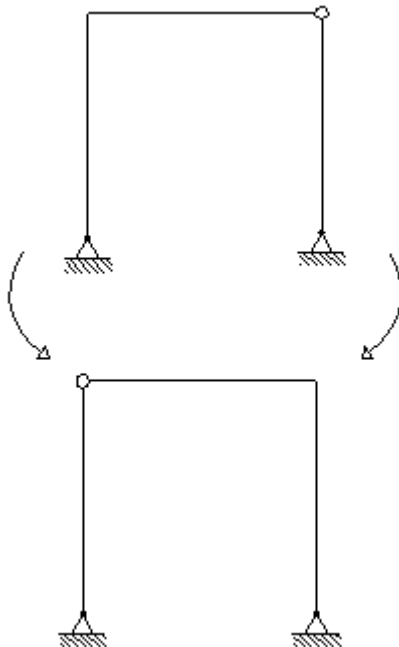


N (kN)

b) 5 m a direita do apoio A. $M_{\text{máx}} = 18 \text{ kN.m}$.

5.

a)



b)

