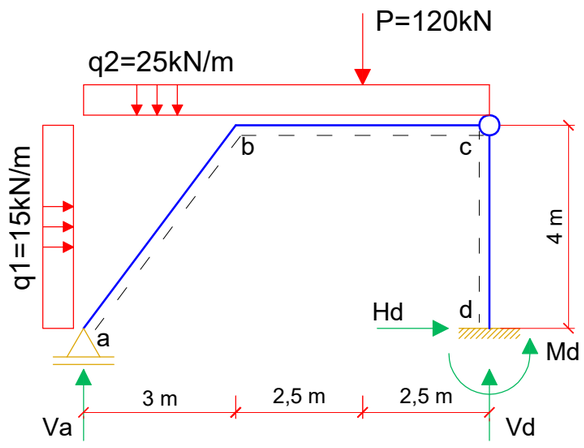
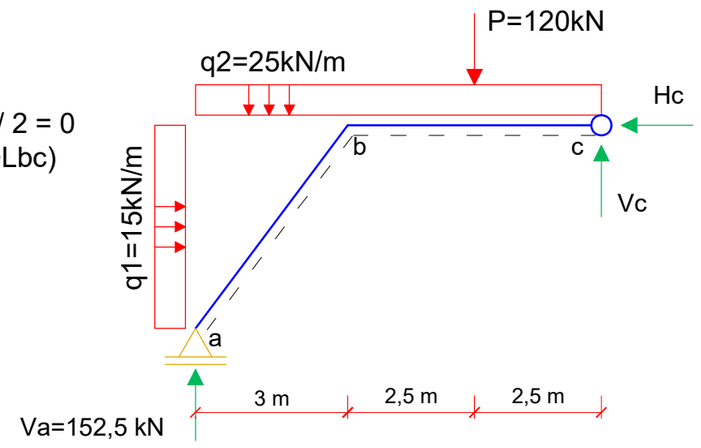
01

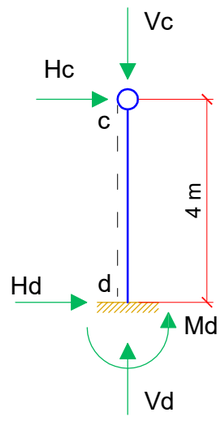
B1T4NB0415A



Somatório de Momentos = 0 no ponto "c"
(+) horário:

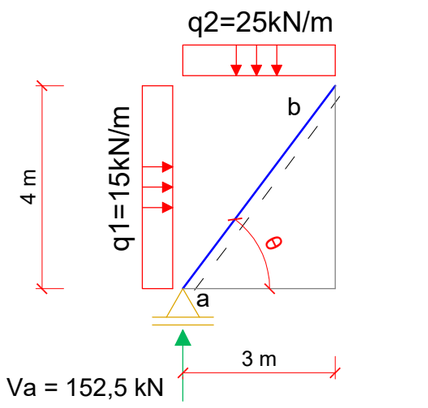
Va*(Labh+Lbc) - P*Lbc/2 - q2*(Labh+Lbc)^2 / 2 - q1*Lcd^2 / 2 = 0
Va=(P*Lbc/2 + q2*(Labh+Lbc)^2 / 2 + q1*Lcd^2 / 2)/(Labh+Lbc)
Va=(120*5 / 2 +25*(3+5)^2 / 2 + 15*4^2 / 2)/(3+5)
Va=1220 / 8=152.5 kN (para cima)



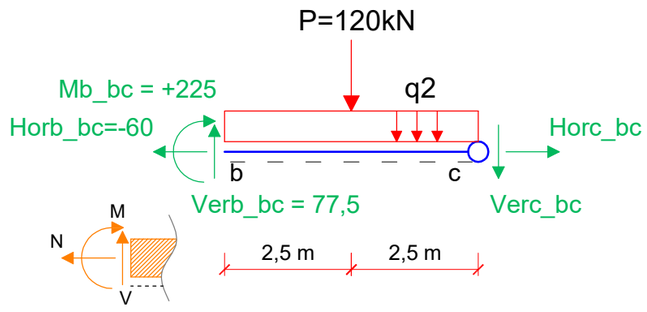


1) Esboçar o diagrama de momentos fletores para a barra "bc"

02



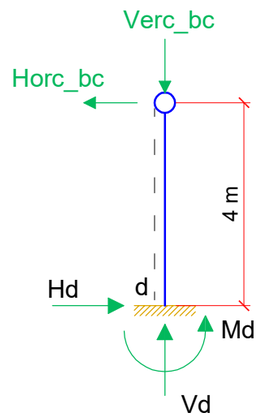
senθ = co/hip =4/5
cosθ = ca/hip =3/5



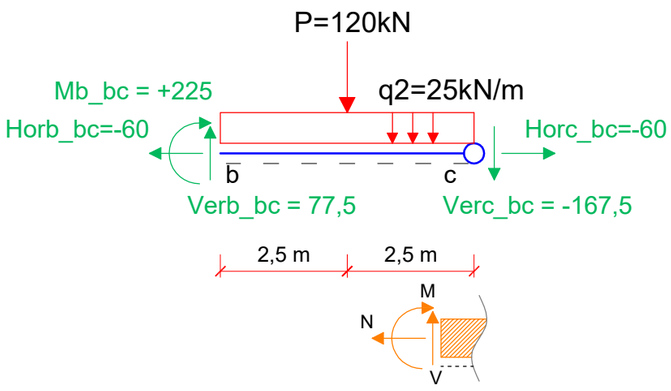
Mb_bc = Va*Labh - q2*Labh^2 / 2 - q1*Labv^2 / 2
Mb_bc = 152,5*3 - 25*3^2 / 2 - 15*4^2 / 2 = + 225 kNm

Verb_bc = Va - q2*Labh = 152,5 - 25*3 = +77,5 kN

Horb_bc = -q1*Labv = -15*4 =- 60 kN



03



Verificação do momento nulo na rótulo "c":

Mc = Mb_bc + Verb_bc*Lbc - P*Lbc/2 - q2*Lbc^2 / 2
Mc = +225 + 77,5*5 - 120*5 / 2 - 25*5^2 / 2 = 0

Cortante no ponto "c":

Vc = Verb_bc - P - q2*Lbc
Vc = +77,5 - 120 - 25*5 = -167,5 kN

MbP(x)=225+77,5*x-25*x^2/2 válida para x=0 até x=2,5
MbP'(x)=77,5 - 25*x = 0 ---> x=3,1 (fora do intervalo x entre 0 e 2,5 m)

MPb(x)=225+77,5*x-25*x^2 / 2 - 120*(x-2,5) válida x=2,5 até x=5,0
MPb'(x)=77,5 - 25*x - 120 = 0 ---> x=-8,5 (também fora do intervalo)

Conclusão: o máximo momento em "bc" é o que ocorre no meio da barra (+340,625 kNm)

04

