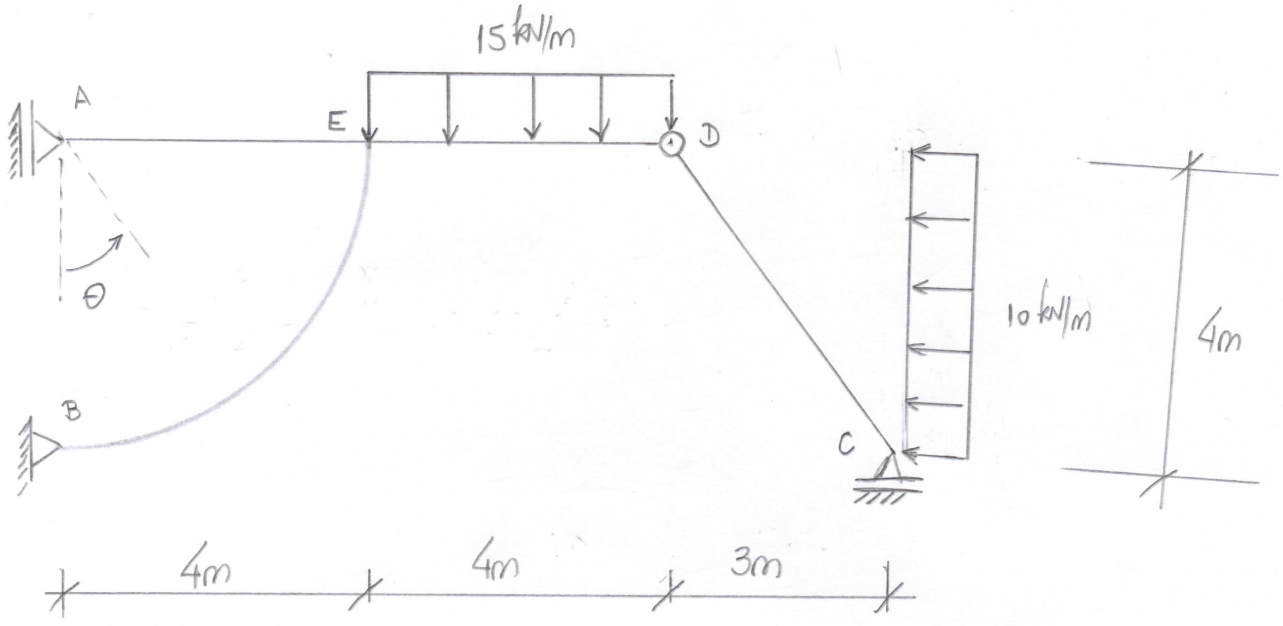
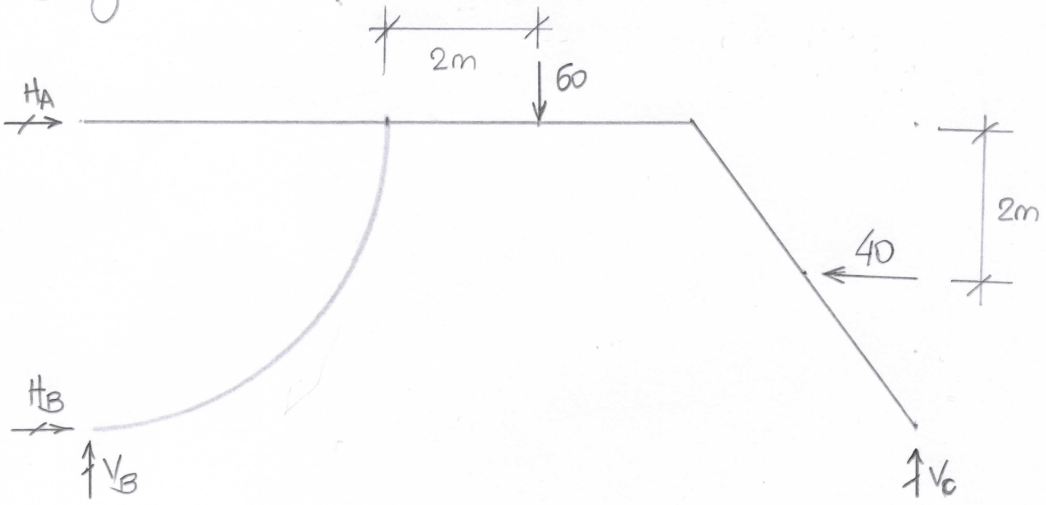
P1 - Q2 - 2° SEM 2017



① Diagrama de Corpo Livre:



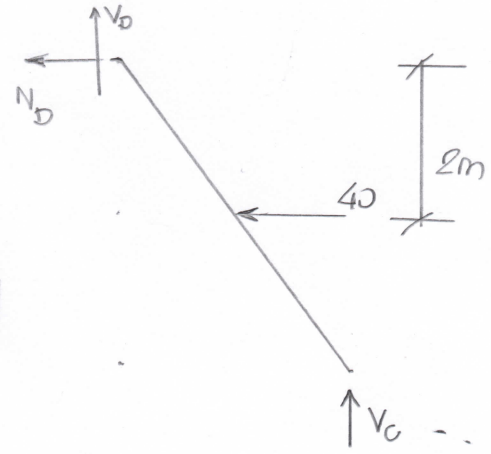
$\sum F_H = 0$: $H_A + H_B = 40$

$\sum F_V = 0$: $V_A + V_C = 60$

$\curvearrowleft(+) \sum M_A = 0$: $H_B \cdot 4 - 60 \cdot 6 - 40 \cdot 2 + V_C \cdot 11 = 0$

$4H_B + 11V_C = 440$

Corte em D:

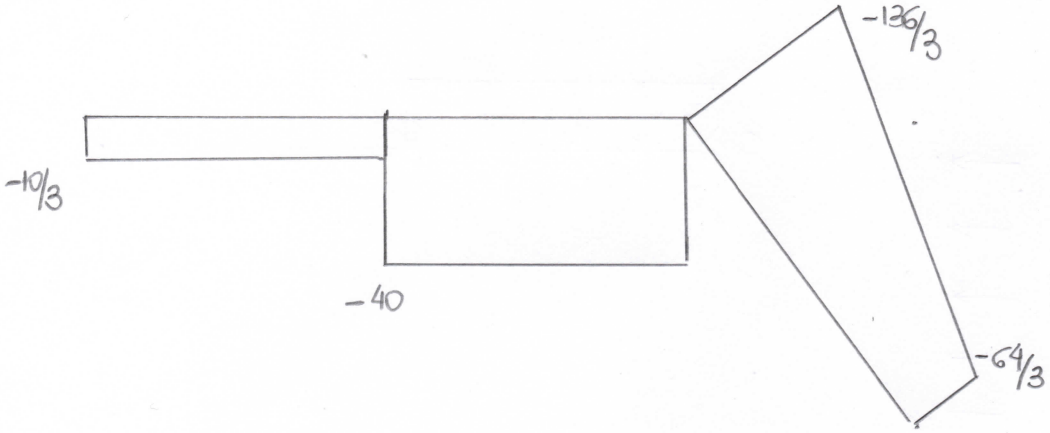


$\curvearrowleft(+) \sum M_D = 0$: $-40 \cdot 2 + V_C \cdot 3 = 0 \Rightarrow$ **$V_C = 80/3$ kN**

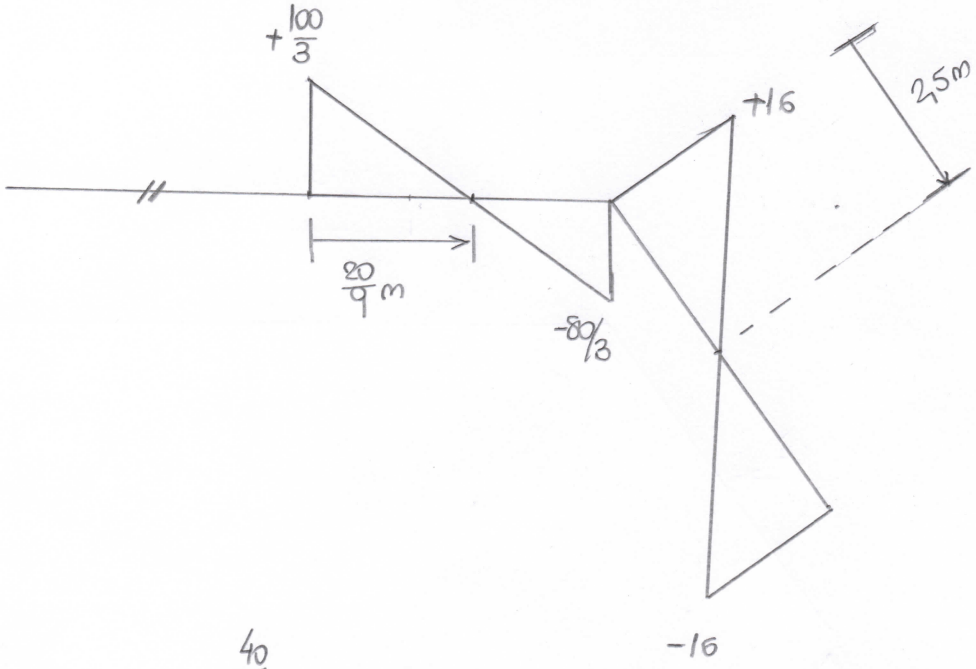
$H_B = 110/3$ kN

$H_A = 10/3$ kN

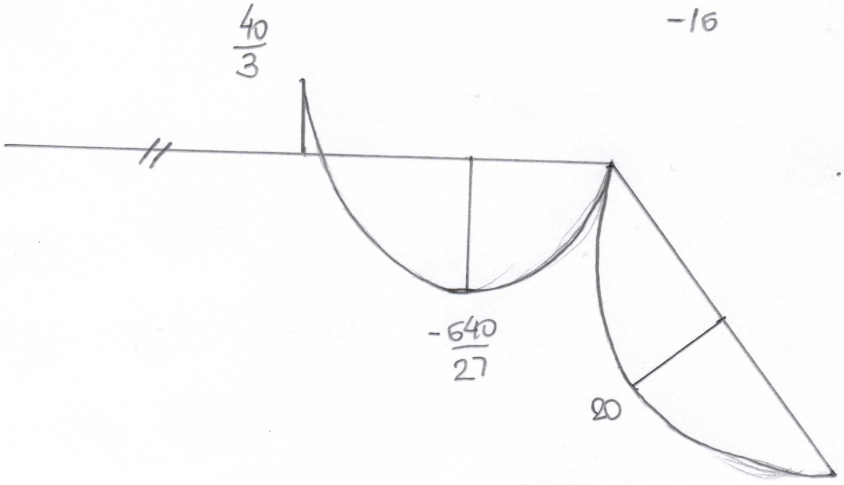
$V_A = 100/3$ kN



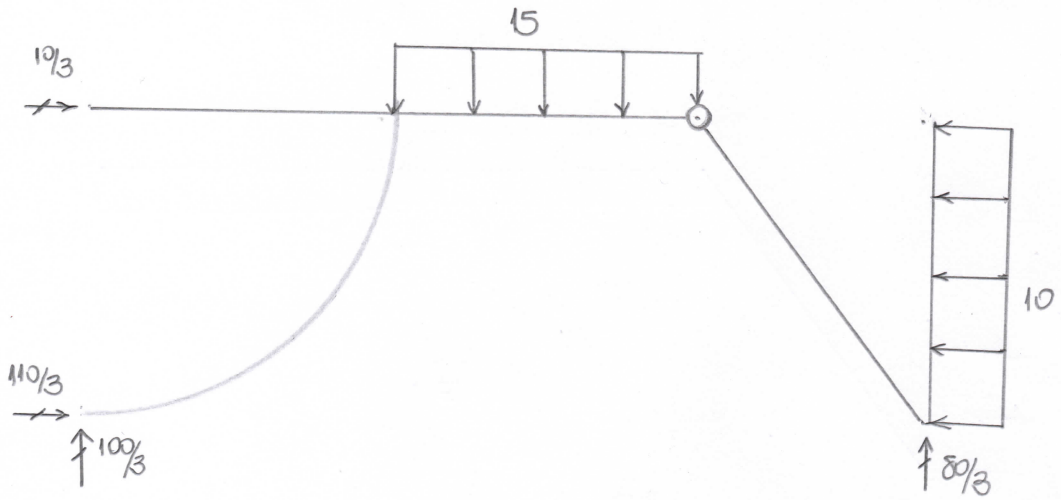
N[kN]



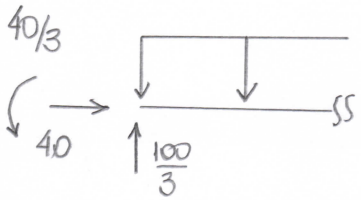
V[kN]



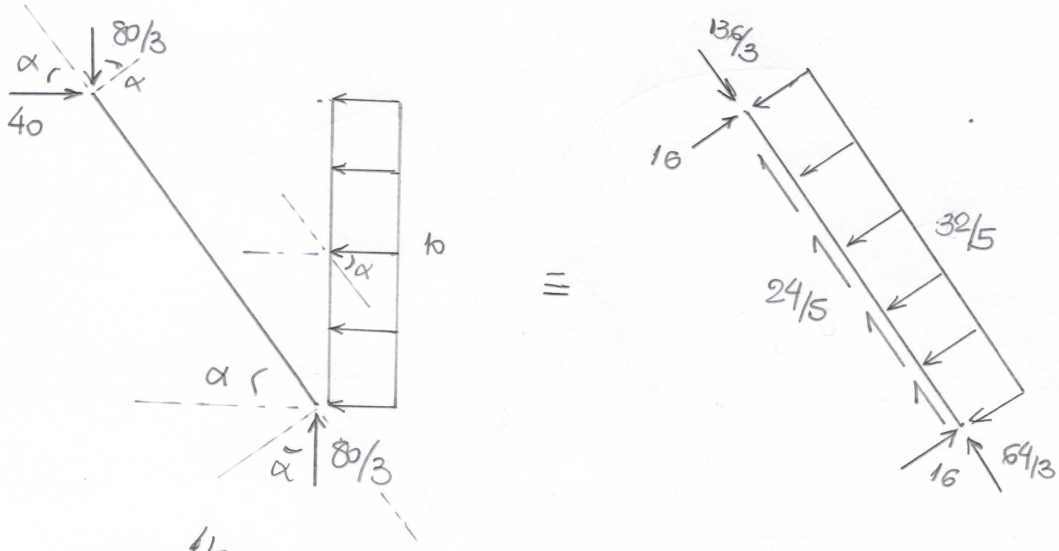
M[kNm]



Transporte para E:

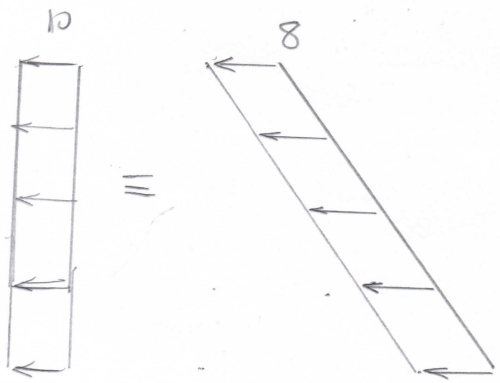


Transporte para D:

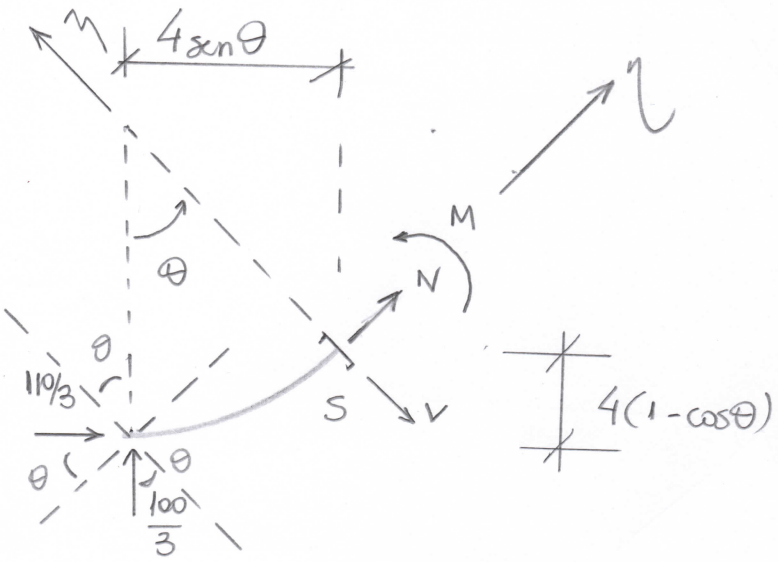


$\operatorname{sen}\alpha = 4/5$

$\cos\alpha = 3/5$



Trecho curvo:



$$\sum F_\eta = 0: \quad N + \frac{110}{3}\cos\theta + \frac{100}{3}\operatorname{sen}\theta = 0$$

$$\boxed{N = -\frac{100}{3}\operatorname{sen}\theta - \frac{110}{3}\cos\theta}$$

$$\sum F_\zeta = 0: \quad -V - \frac{110}{3}\operatorname{sen}\theta + \frac{100}{3}\cos\theta = 0$$

$$\boxed{V = \frac{100}{3}\cos\theta - \frac{110}{3}\operatorname{sen}\theta}$$

$$\curvearrowright + \sum M_S = 0: \quad M + \frac{110}{3}\cdot 4(1-\cos\theta) - \frac{100}{3}\cdot 4\operatorname{sen}\theta = 0$$

$$\boxed{M = \frac{400}{3}\operatorname{sen}\theta + \frac{440}{3}\cos\theta - \frac{440}{3}}$$