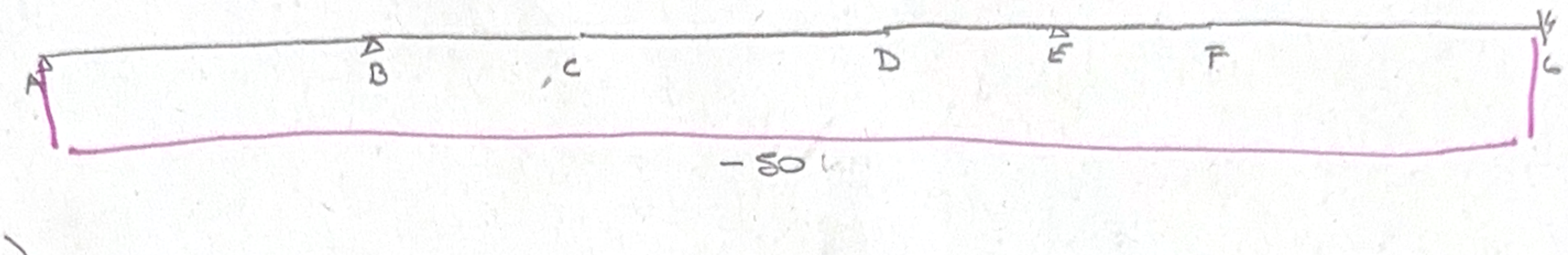
Ejercicio 1

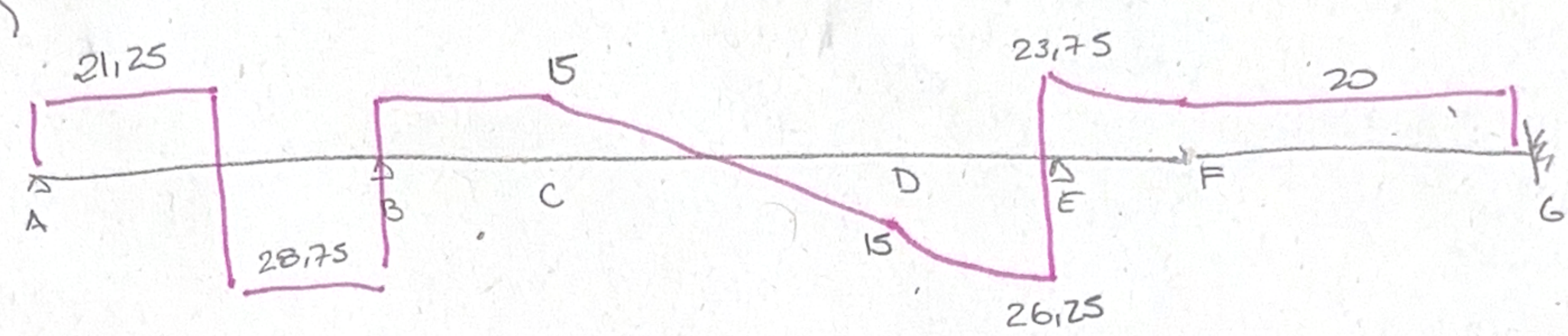
a) $V_A = 21{,}25\,kN$ $V_B = 43{,}75\,kN$ $V_E = 50\,kN$ $V_6 = -20\,kN$ $H_6 = 50\,kN \leftarrow$ $M_6 = 60\,kNm$)

b)

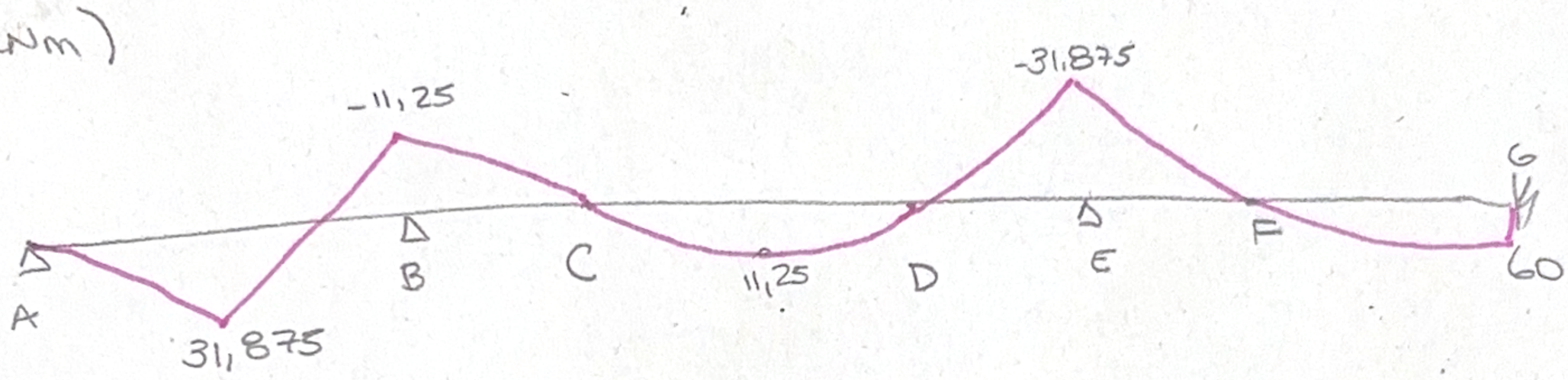
N(kN)



V(kN)



M(kNm)

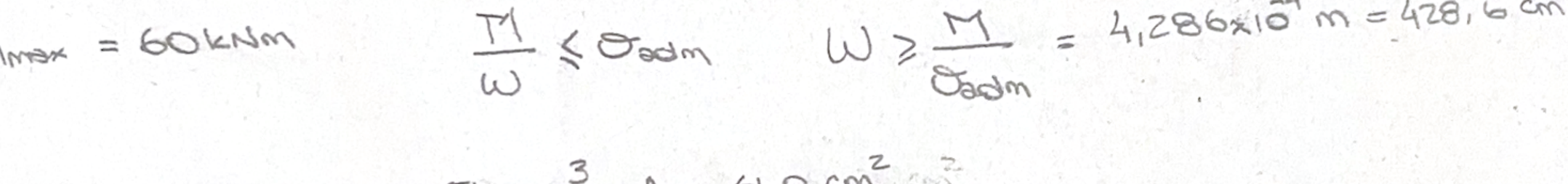


$M_{max} = 60\,kNm$ $\frac{M}{W} \leq \sigma_{adm}$ $W \geq \frac{M}{\sigma_{adm}} = 4{,}286 \times 10^{-4}\,m^3 = 428{,}6\,cm^3$

IPN 280 → $W = 542\,cm^3$ $A = 61{,}0\,cm^2$

$\frac{M}{W} + \frac{N}{A} = 119\,MPa$ ✓

c)



$\Theta_B = \frac{50\,kN\,(3m)^2}{16EI} - \frac{11{,}25\,kNm\,(3m)}{3EI} = \frac{16{,}875\,kNm^2}{EI}$

$\delta_C = \frac{15kN \cdot (0{,}75m)^3}{3EI} - \Theta_B \cdot 0{,}75m = \frac{-10{,}55\,kNm^3}{EI} = -0{,}7\,mm$