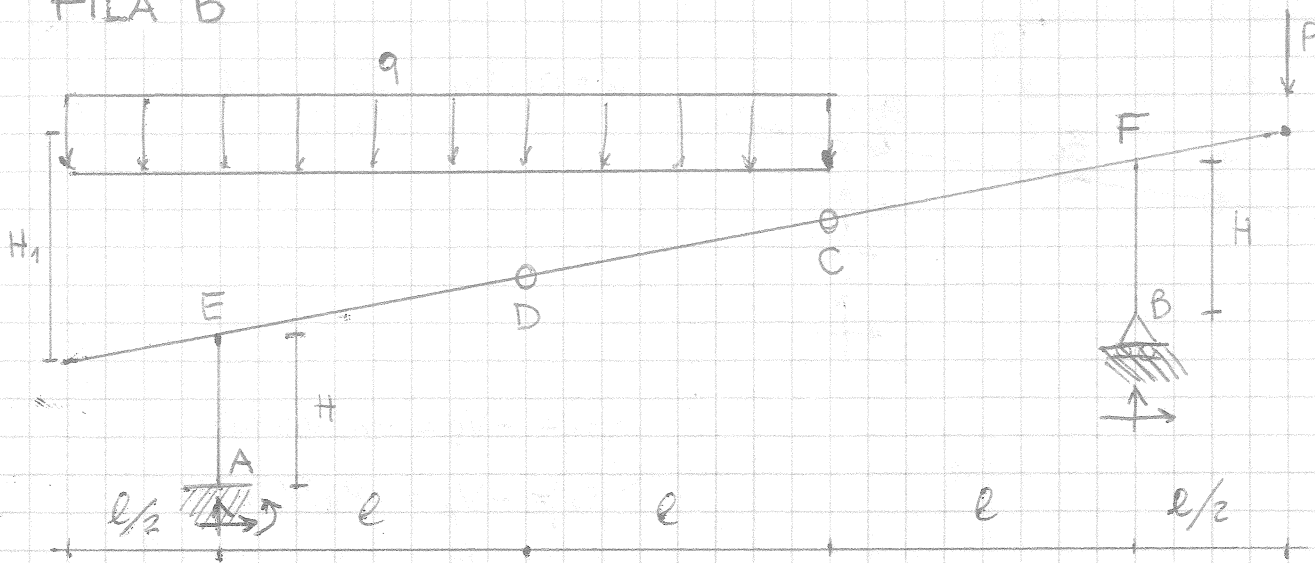


FILA B



$$H = 2\text{m} \quad L = 4\text{m} \quad q = 1000 \text{ K/m} \quad P = 0,5 \text{ kN} \quad H_1 = 3\text{m} = \frac{3}{2}H$$

c) tratto CFB

$$V_B \cdot l + H_B \cdot \left(H - \frac{H_1}{4}\right) - P \cdot \frac{3}{2}l = 0 \quad V_B \cdot l + H_B \cdot \frac{5}{8}H - \frac{3}{2}Pe = 0 \quad (*)$$

d) tratto DCFB

$$V_B \cdot 2l + H_B \left(H - \frac{H_1}{2}\right) - P \cdot \frac{5}{2}l - \frac{ql^2}{2} = 0 \quad V_B \cdot 2l + H_B \cdot \frac{H}{4} - \frac{5}{2}Pe - \frac{ql^2}{2} = 0 \quad (**)$$

Sistema $2(*) - (**)$

$$2V_B l - 2V_B l + 5H_B \cdot \frac{H}{4} - H_B \cdot \frac{H}{4} - 3Pe + 5Pe + \frac{ql^2}{2} = 0$$

$$H_B \cdot H - \frac{Pe}{2} + \frac{ql^2}{2} = 0 \quad H_B = \frac{P}{2} \frac{l}{H} + \frac{q}{2} \frac{l^2}{H} = -3,5 \text{ kN}$$

$$(*) \Rightarrow V_B \cdot l + \frac{5}{8}H_B \cdot H - \frac{3}{2}Pe = 0 \quad V_B \cdot l = \frac{3}{2}Pe + \frac{5}{8} \cdot 3,5 \cdot H = 7,375 \text{ kNm}$$

$$V_B = 7,375/l = 1,844$$

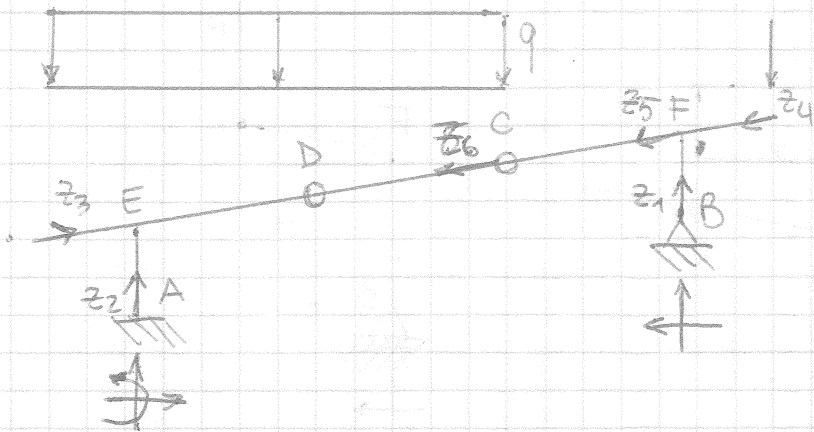
$$\uparrow) V_A + V_B - q \frac{5}{2}l - P = 0 \quad V_A = P + \frac{5}{2}ql - V_B = 8,656 \text{ kN}$$

$$\rightarrow H_A + H_B = 0 \quad H_A = -H_B = 3,5 \text{ kN}$$

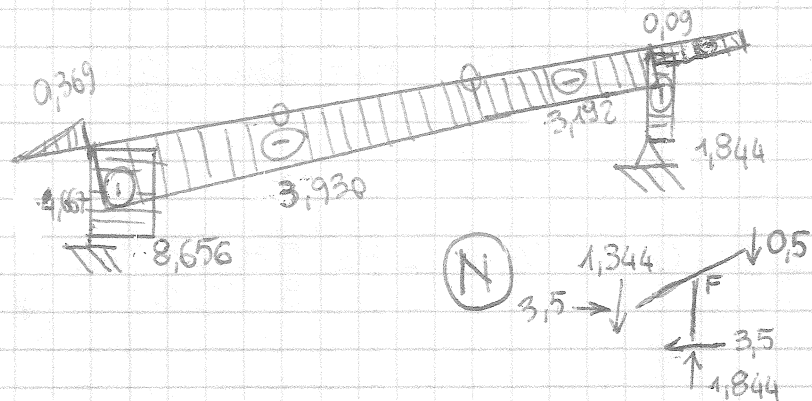
d) tratto DEA

$$-V_A \cdot l + H_A \cdot \left(H + \frac{H_1}{4}\right) + \frac{q}{2} \left(\frac{3}{2}l\right)^2 + M_A = 0$$

$$M_A = V_A \cdot l - \frac{q}{2} \frac{9}{4}l^2 - H_A \cdot \frac{11}{8}H = 7,000 \text{ kNm}$$



$$\alpha = \arctan\left(\frac{3}{16}\right) = 10,62^\circ$$



$$N(z_1) = -V_B = -1,844 \text{ kN}$$

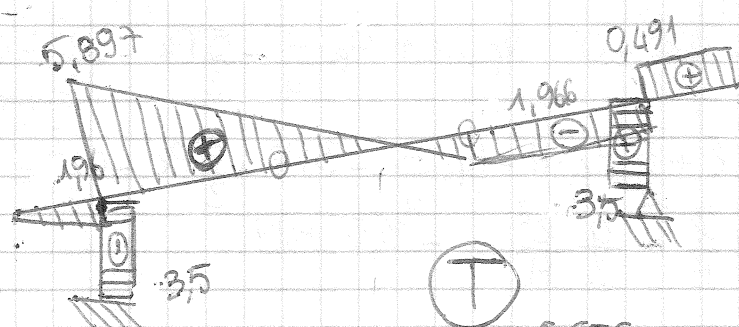
$$N(z_2) = -V_A = -8,656 \text{ kN}$$

$$N(z_3) = q(z_3 \cos \alpha) \cdot \sin \alpha$$

$$N(z_4) = -P \cdot \sin \alpha$$

$$N(z_5) = -P \cdot \sin \alpha + V_B \cdot \sin \alpha - H_B \cdot \cos \alpha$$

$$N(z_6) = \left(\frac{5}{8}P\right) \cdot \sin \alpha - H_B \cdot \cos \alpha + q(z_6 \cos \alpha) \cdot \sin \alpha$$



$$T(z_1) = +H_B = 3,5 \text{ kN}$$

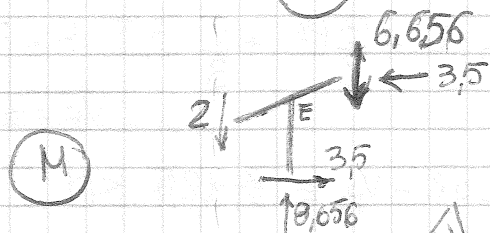
$$T(z_2) = -H_A = -3,5 \text{ kN}$$

$$T(z_3) = -q(z_3 \cos \alpha) \cdot \cos \alpha$$

$$T(z_4) = P \cdot \cos \alpha$$

$$T(z_5) = P \cdot \cos \alpha - V_B \cdot \cos \alpha - H_B \cdot \sin \alpha$$

$$T(z_6) = (P - V_B) \cdot \cos \alpha - H_B \cdot \sin \alpha + q(z_6 \cos \alpha) \cdot \cos \alpha$$



$$M(z_1) = H \cdot z_1$$

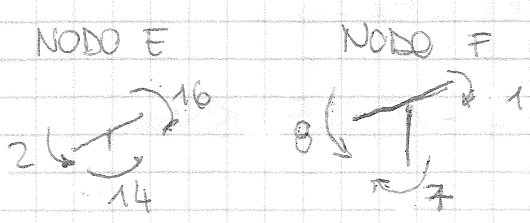
$$M(z_2) = -M_A - H_A \cdot z_2$$

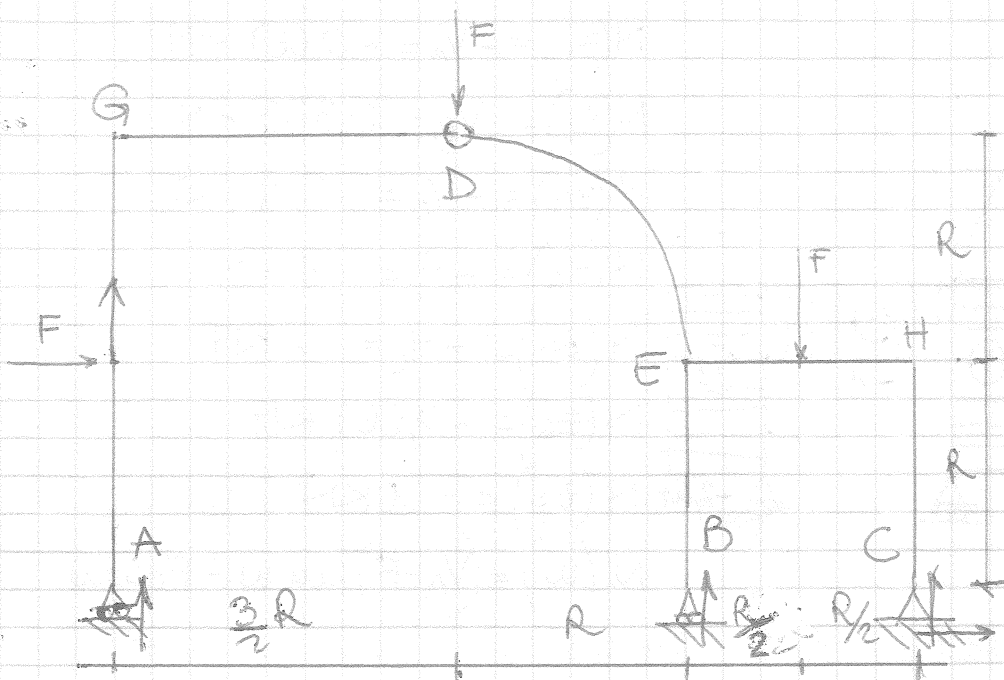
$$M(z_3) = -\frac{q}{2}(z_3 \cos \alpha)^2$$

$$M(z_4) = -P \cdot z_4 \cos \alpha$$

$$M(z_5) = -H_B \cdot \left(\frac{5}{8}l \cdot \sin \alpha\right) - P \cdot \left(\frac{3}{2}l + z_5 \cdot \cos \alpha\right) + V_B \cdot (z_4 \cdot \cos \alpha)$$

$$M(z_6) = V_B \left(2 + z_6 \cdot \cos \alpha\right) - H_B \left(\frac{5}{8}l - \frac{3}{8}l \cdot \sin \alpha\right) - P \left(\frac{3}{2}l + z_6 \cdot \cos \alpha\right) - \frac{q}{2}(z_6 \cos \alpha)^2$$





$$R = 3\text{m}$$

$$F = 1\text{KN}$$

$$\rightarrow) F + H_C = 0 \quad H_C = -F = -1\text{KN}$$

D) tratto DGA

$$-V_A \cdot \frac{3}{2}R + F \cdot R = 0 \quad V_A \frac{3}{2}R = FR \quad V_A = \frac{2}{3}F = 0,667\text{KN}$$

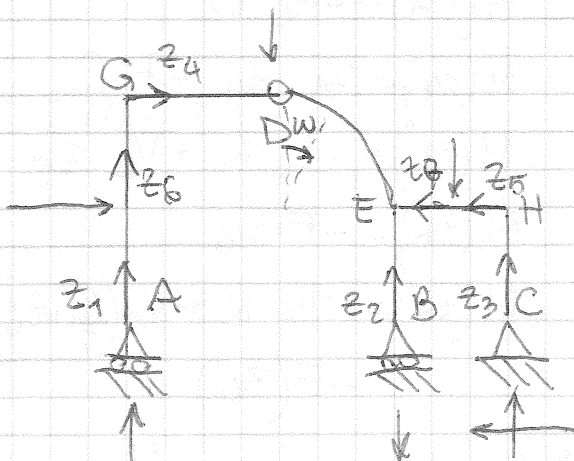
$$C) F \cdot \frac{R}{2} - V_B \cdot R + F \cdot 2R - F \cdot R = V_A \cdot (2R + \frac{3}{2}R) = 0$$

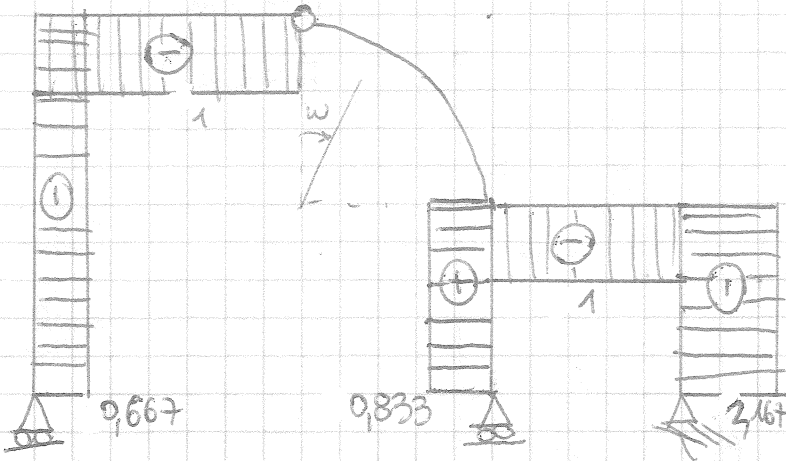
$$V_B \cdot R = F \cdot \frac{3}{2}R - \frac{8}{3}F \cdot \frac{7}{8}R = F \frac{9 - 14}{6}R = -\frac{5}{6}FR$$

$$V_B = -\frac{5}{6}F = 0,833$$

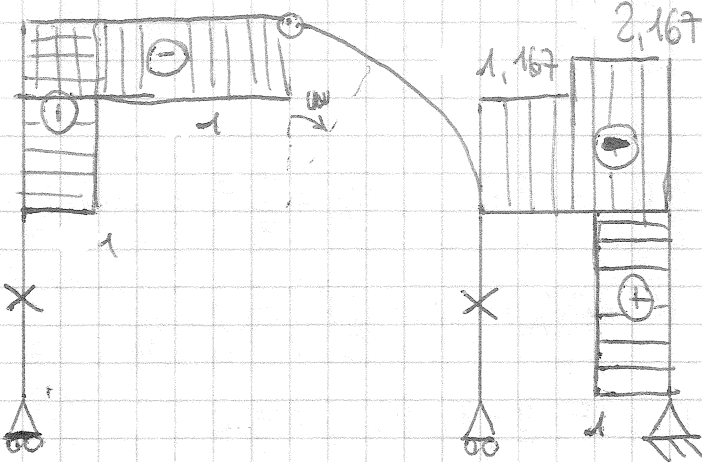
$$\uparrow) V_A + V_B + V_C - 2F = 0$$

$$V_C = 2F - V_A - V_B = \frac{2}{1}F + \frac{5}{6}F - \frac{2}{3}F = \frac{13}{6}F = 2,167\text{KN}$$

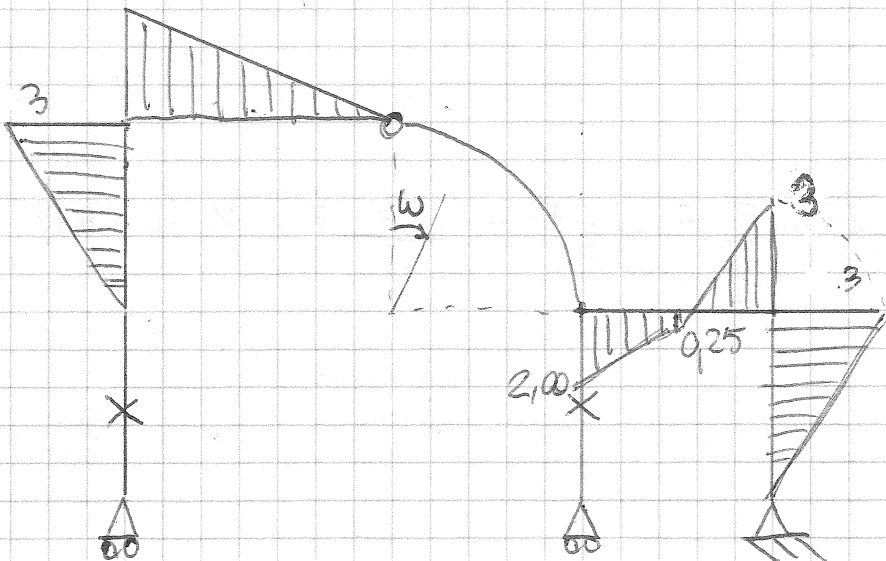




$$\begin{aligned}
 N(z_1) &= -V_A = -0,667 \text{ kN} \\
 N(z_2) &= V_B = 0,833 \text{ kN} \\
 N(z_3) &= -V_C = -2,167 \text{ kN} \\
 N(z_4) &= -F = -1 \text{ kN} \\
 N(z_5) &= -H_C = -1 \text{ kN} \\
 N(z_6) &= -0,667 \text{ kN} \\
 N(z_7) &= -1 \text{ kN} \\
 N(w) &= (V_A - F) \sin w - F \cos w
 \end{aligned}$$



$$\begin{aligned}
 T(z_1) &= 0 \\
 T(z_2) &= 0 \\
 T(z_3) &= +H_C = 1 \text{ kN} \\
 T(z_4) &= +V_A = 0,667 \text{ kN} \\
 T(z_5) &= V_C = 2,167 \text{ kN} \\
 T(z_6) &= -F = -1 \text{ kN} \\
 T(z_7) &= V_C + F = 1,167 \\
 T(w) &= (V_A - F) \cos w + F \sin w
 \end{aligned}$$



$$\begin{aligned}
 M(z_1) &= 0 \\
 M(z_2) &= 0 \\
 M(z_3) &= -H_C \cdot z_3 \\
 M(z_4) &= V_A \cdot z_4 - F \cdot R \\
 M(z_5) &= -H_C \cdot R + V_C \cdot z_5 \\
 M(z_6) &= -F \cdot z_6 \\
 M(z_7) &= -H_C \cdot R + V_C \left(\frac{R}{2} + z_6\right) - F(z_6)
 \end{aligned}$$

$$M(w) = V_A \cdot \left(\frac{3R}{2} + R \sin w\right) - FR(1 - \cos w) - FR \sin w$$