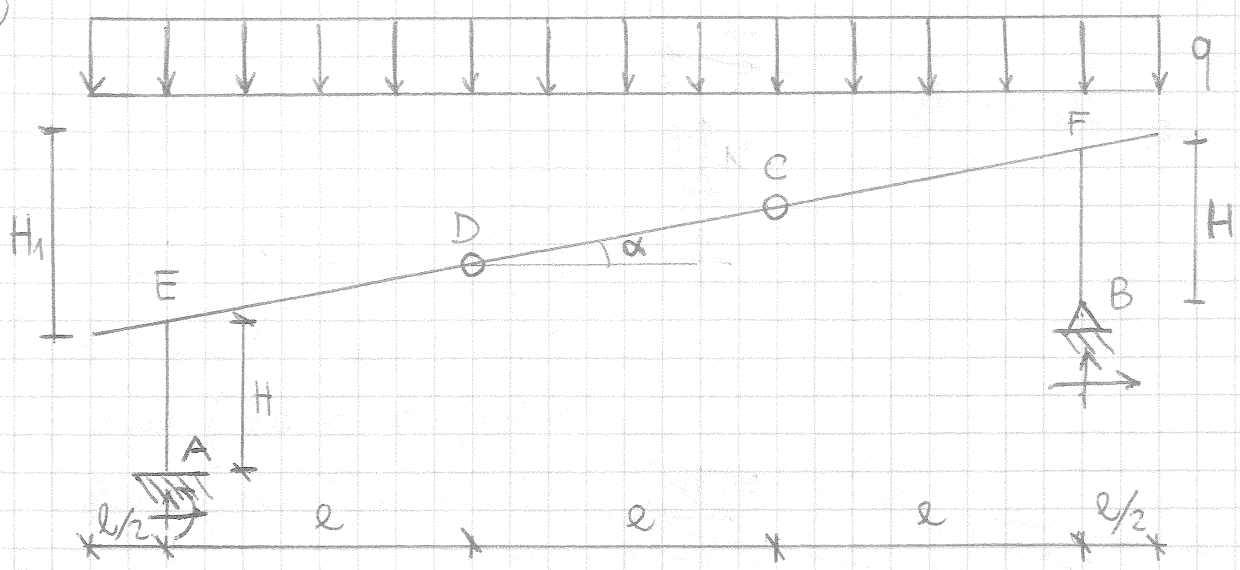
FILA A

① 

$H = 2m \quad L = 4\ m$

$q = 1{,}000\ kN/m \quad H_1 = \frac{3}{2}H$

C) TRATTO CFB

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

$$V_B \cdot l + H_B \frac{5}{8}H = \frac{9}{8} q l^2 \qquad (*)$$

D) $$V_B \cdot 2l + H_B \left(H - \frac{H_1}{2}\right) - \frac{q}{2}\left(\frac{5}{2}l\right)^2 = 0$$

$$V_B \cdot 2l + H_B \cdot \frac{1}{4}H = \frac{25}{8} q l^2 \qquad (**)$$

Sistema $2(*) - (**) \Rightarrow 2V_B l - 2V_B l + H_B \frac{5}{4}H - H_B \frac{1}{4}H =$

$$= \frac{9}{4} q l^2 - \frac{25}{8} q l^2$$

$$\Rightarrow H_B \cdot H = -\frac{7}{8}\frac{q l^2}{H} = -7\ kN$$

$(*)$ $$V_B = \frac{9}{8}\frac{q l^2}{l} - \frac{H_B}{l}\frac{5}{8} \cdot H = 6{,}688\ kN$$

↑) $V_A + V_B + 4ql = 0 \qquad V_A = 4ql - V_B = 9{,}312\ kN$

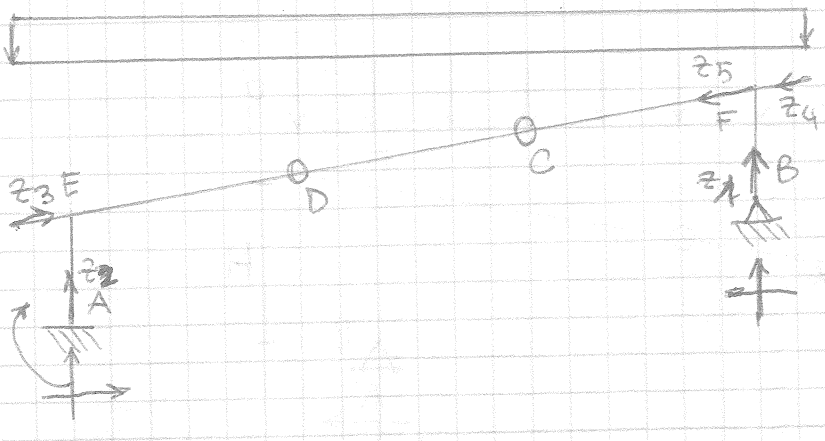
→) $H_A = -H_B = 7\ kN$

D) Tratto DEA

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

$$M_A = V_A \cdot l - H_A \frac{11}{8}H - \frac{9}{8} q l^2 = -0{,}0012\ kNm$$

$\alpha = \arctan(H_1/4\ell) = 10,620°$



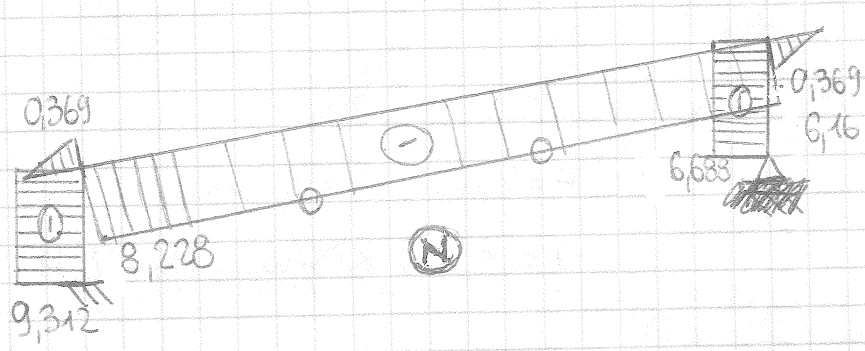
$N(z_1) = -V_B = -6,688\ kN$

$N(z_2) = -V_A = -9,312\ kN$

$N(z_3) = q\,(z_3 \cos\alpha)\,\operatorname{sen}\alpha$

$N(z_4) = -q\,(z_4 \cos\alpha)\,\operatorname{sen}\alpha$

$N(z_5) = -q\frac{\ell}{2}\operatorname{sen}\alpha - H_B\cos\alpha + V_B \operatorname{sen}\alpha = q(z_5\cos\alpha)\operatorname{sen}\alpha$



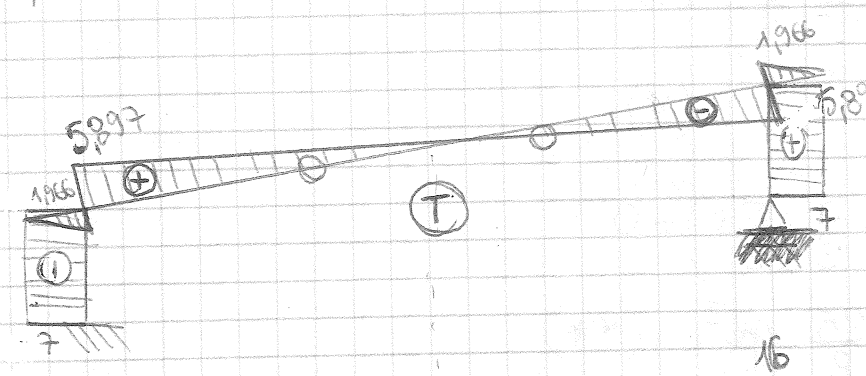
$T(z_1) = +H_B = 7\ kN$

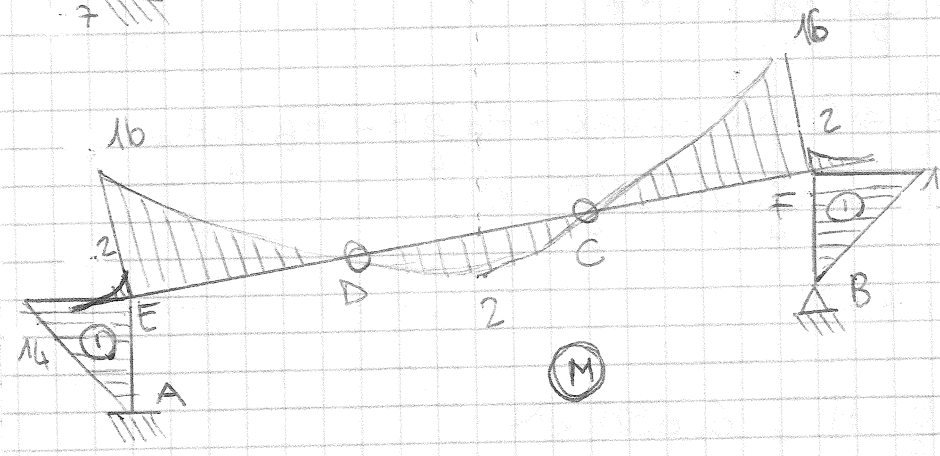
$T(z_2) = -H_A = -7\ kN$

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

$T(z_4) = q\,(z_4\cdot\cos\alpha)\cdot\cos\alpha$

$T(z_5) = q\frac{\ell}{2}\cos\alpha - V_B\cos\alpha - H_B\operatorname{sen}\alpha + q\cdot(z_5\cos\alpha)\cdot\cos\alpha$





$M(z_1) = -H_B \cdot z_1$

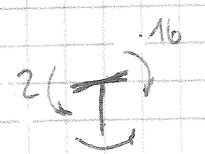
$M(z_2) = -H_A \cdot z_2 + M_A$

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

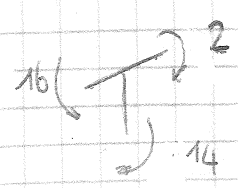
$M(z_4) = -\frac{q}{2}(z_4\cos\alpha)^2$

$M(z_5) = -\frac{q}{2}\left(\frac{\ell}{2} + \frac{z_4}{2}\cdot\cos\alpha\right)^2 + V_B\cdot(\cos\alpha\cdot z_4) + -H_B(H - H\operatorname{sen}\alpha)$

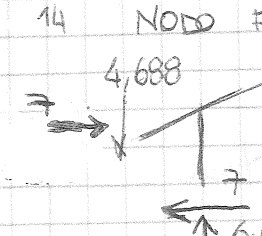
NODO E



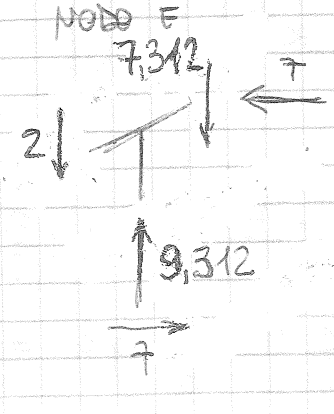
NODO F



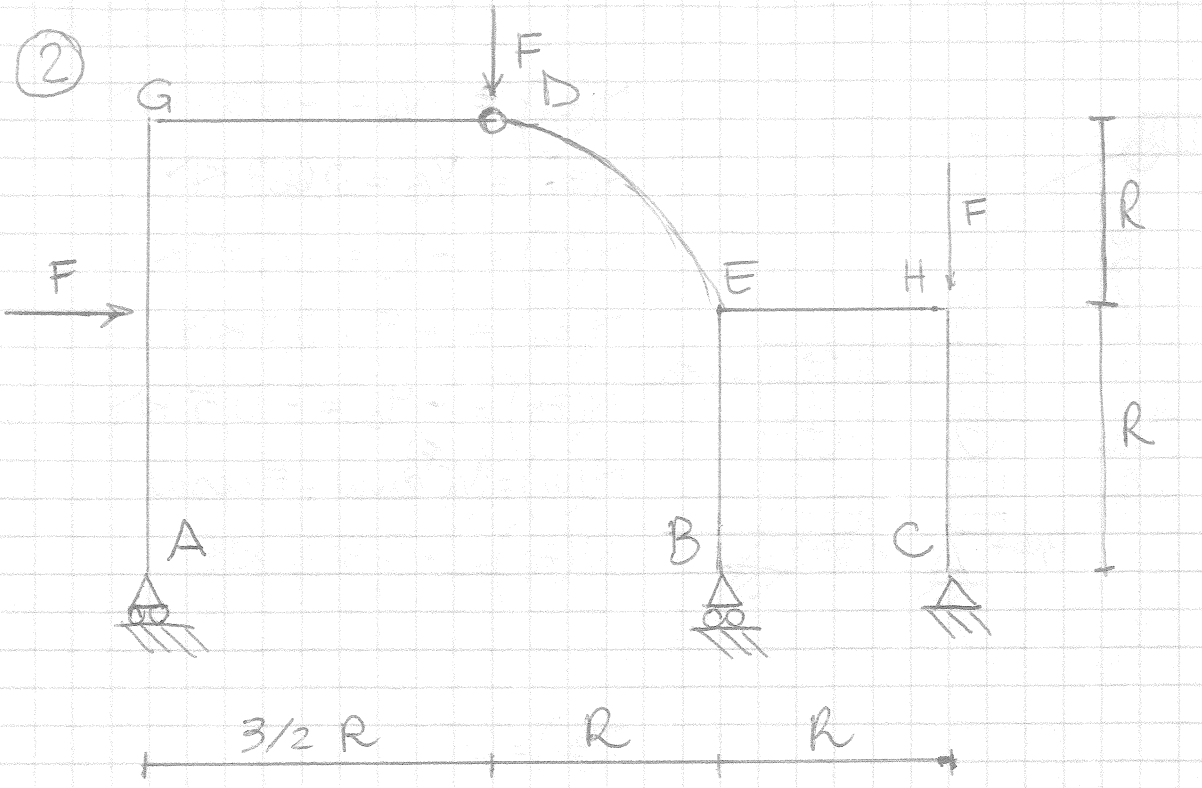
NODO F



NODO F



(2)



R = 3 m

F = 0,500 kN

→) $F + H_A = 0 \qquad H_A = -F = -0{,}5\ kN$

D) Tratto DHA

$$-V_A \cdot \frac{3}{2}R + F \cdot R = 0 \qquad V_A = \frac{2FR}{3R} = \frac{2}{3}F = 0{,}333\ kN$$

C) $$-V_A\left(2R + \frac{3}{2}R\right) - FR + F2R - V_B \cdot R = 0$$

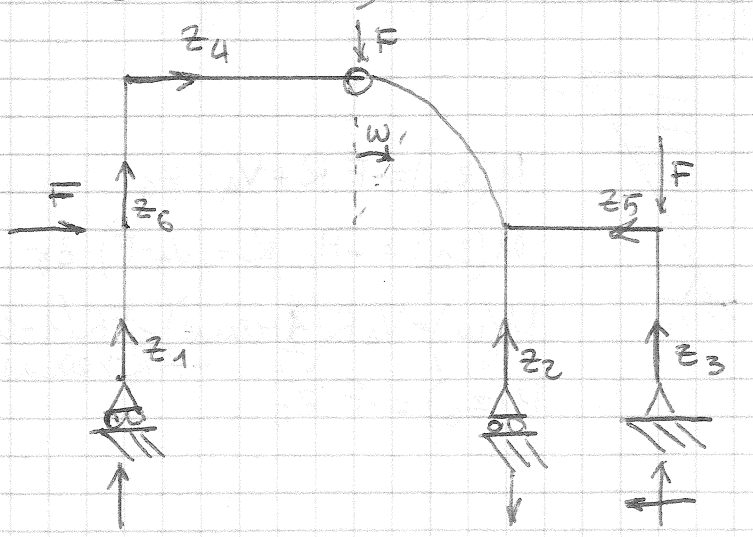
$$V_B \cdot R = F2R - FR - V_A\left(2R + \frac{3}{2}R\right)$$

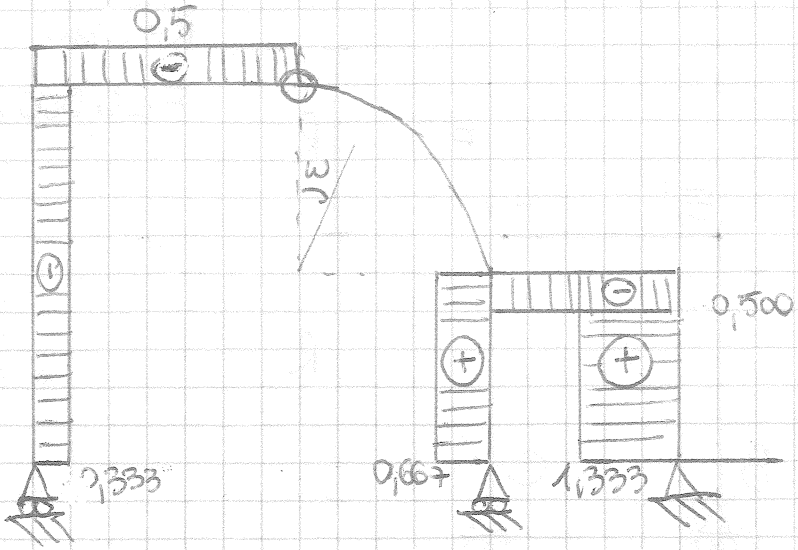
$$= FR - \frac{2}{3}F\frac{7}{2}R = FR - \frac{7}{3}FR = -\frac{4}{3}FR$$

$$V_B \cdot R = -\frac{4}{3}FR = 0{,}667\ kN$$

↑) $$V_A - 2F + V_B + V_C = 0$$

$$\frac{2}{3}F - 2F - \frac{4}{3}F + V_C = 0 \qquad V_C = 2F + \frac{4}{3}F - \frac{2}{3}F = \frac{8}{3}F = 1{,}333\ kN$$





$N(z_1) = -V_A = -0{,}333\ kN$

$N(z_2) = V_B = 0{,}667\ kN$

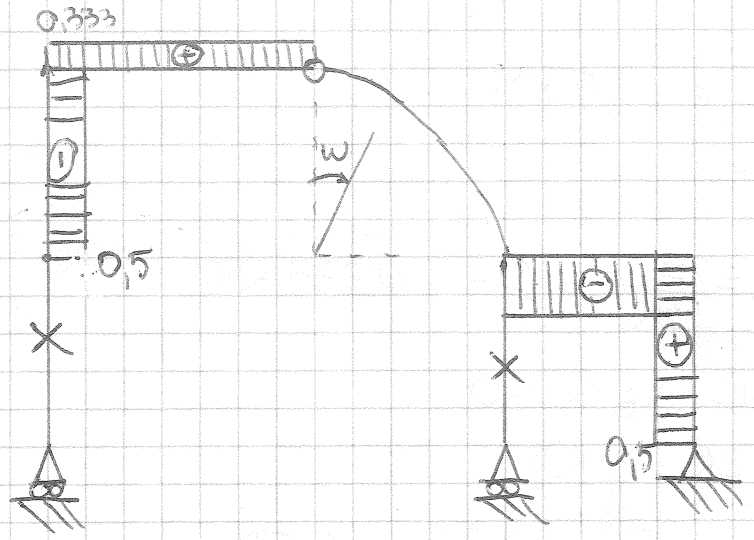
$N(z_3) = -V_C = -1{,}333\ kN$

$N(z_4) = +F = 0{,}5\ kN$

$N(z_5) = -H_C = -0{,}5\ kN$

$N(\omega) = (V_A - F)\sin\omega - F\cos\omega$

$N(z_6) = -0{,}333\ kN$



$T(z_1) = 0$

$T(z_2) = 0$

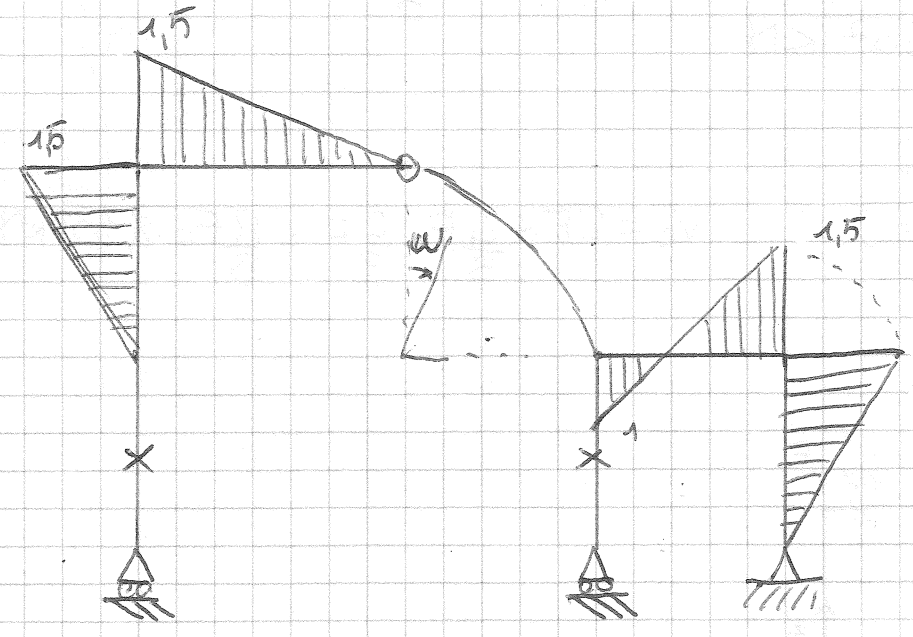
$T(z_3) = H_C = 0{,}5\ kN$

$T(z_4) = +V_A = 0{,}333\ kN$

$T(z_5) = -V_C + F = -0{,}833\ kN$

$T(\omega) = (V_A - F)\cos\omega + F\sin\omega$

$T(z_6) = -F = -0{,}5\ kN$



$M(z_1) = 0$

$M(z_2) = 0$

$M(z_3) = -H \cdot z_3$

$M(z_4) = -F \cdot R + V_A \cdot z_4$

$M(z_5) = -H_C \cdot R + (V_A - F) \cdot z_5$

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

$M(z_6) = -F \cdot z_6$