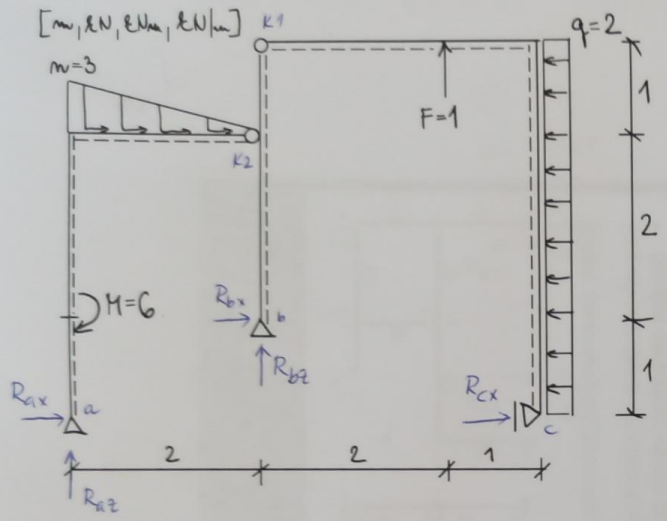
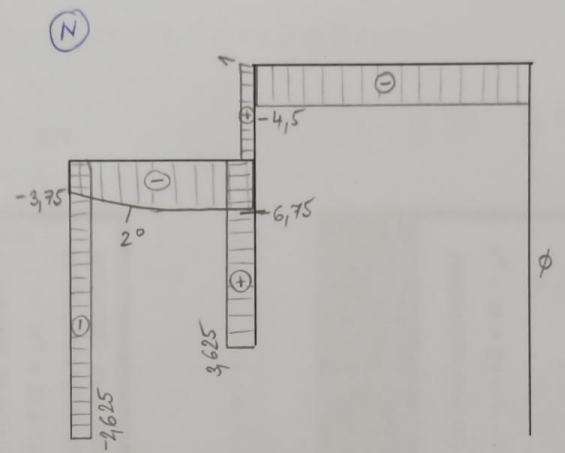




$\oplus\circlearrowleft \sum M_{1,K1}^{P} = 0: \quad F \cdot 2 - q \cdot 4 \cdot 2 + R_{cx} \cdot 4 = 0$

$R_{cx} = \dfrac{-1 \cdot 2 + 2 \cdot 4 \cdot 2}{4}$

$R_{cx} = 3{,}5\,kN \quad (\rightarrow)$

$\oplus\circlearrowleft \sum M_{1,K2}^{P} = 0: \quad F \cdot 2 - q \cdot 4 \cdot 1 + R_{cx} \cdot 3 + R_{bx} \cdot 2 = 0$

$R_{bx} = \dfrac{-1 \cdot 2 + 2 \cdot 4 \cdot 1 - 3{,}5 \cdot 3}{2}$

$R_{bx} = -2{,}25\,kN \quad (\leftarrow)$

$\oplus\circlearrowleft \sum M_{ia} = 0:$

$-M - \frac{1}{2} n \cdot 2 \cdot 3 - R_{bx} \cdot 1 + R_{bz} \cdot 2 + F \cdot 4 + q \cdot 4 \cdot 2 = 0$

$R_{bz} = \dfrac{6 + \frac{1}{2} \cdot 3 \cdot 2 \cdot 3 + (-2{,}25 \cdot 1) - 1 \cdot 4 - 2 \cdot 4 \cdot 2}{2}$

$R_{bz} = -3{,}625\,kN \quad (\downarrow)$

$\oplus\circlearrowleft \sum M_{ic} = 0: \quad q \cdot 4 \cdot 2 - F \cdot 1 - \frac{1}{2} n \cdot 2 \cdot 3 - M - R_{bx} \cdot 1 - R_{bz} \cdot 3 - R_{az} \cdot 5 = 0$

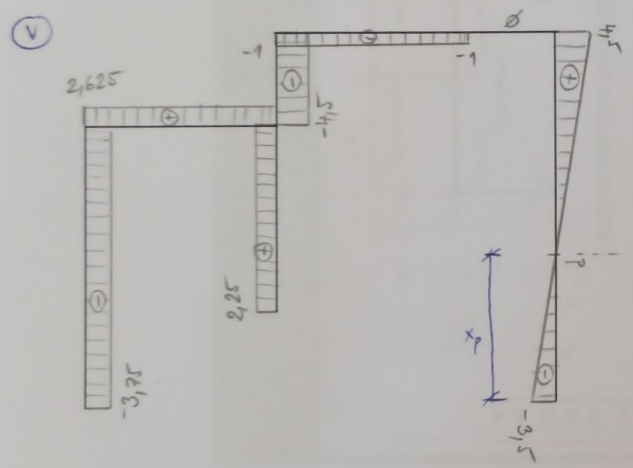
$R_{az} = \dfrac{+2 \cdot 4 \cdot 2 - 1 \cdot 1 - \frac{1}{2} \cdot 3 \cdot 2 \cdot 3 - 6 - (-2{,}25) \cdot 1 - (-3{,}625) \cdot 3}{5}$

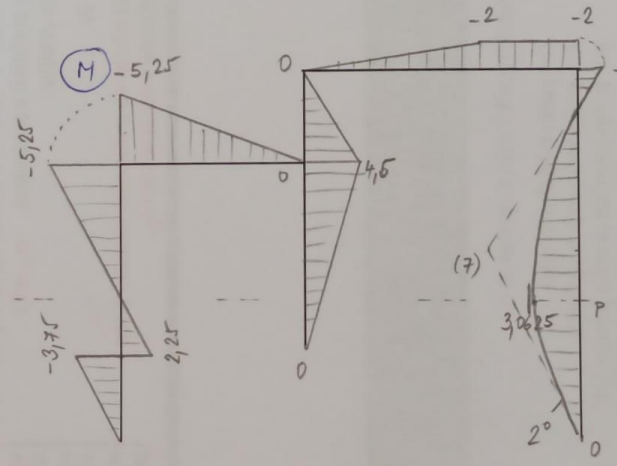
$R_{az} = 2{,}625\,kN \quad (\uparrow)$

$\oplus\circlearrowleft \sum M_{ik2}^{L} = 0: \quad -M + R_{ax} \cdot 3 - R_{az} \cdot 2 = 0$

$R_{ax} = \dfrac{6 + 2{,}625 \cdot 2}{3}$

$R_{ax} = 3{,}75\,kN \quad (\rightarrow)$





$V_p^P = 0: \quad -R_{cx} + q \cdot x_p = 0$

$x_p = \dfrac{R_{cx}}{q} = \dfrac{3{,}5}{2} = 1{,}75\,m$

$M_p^P = R_{cx} \cdot x_p - q \cdot x_p \cdot \dfrac{x_p}{2} =$

$= 3{,}5 \cdot 1{,}75 - 2 \cdot \dfrac{1{,}75^2}{2} = 3{,}0625\,kNm$

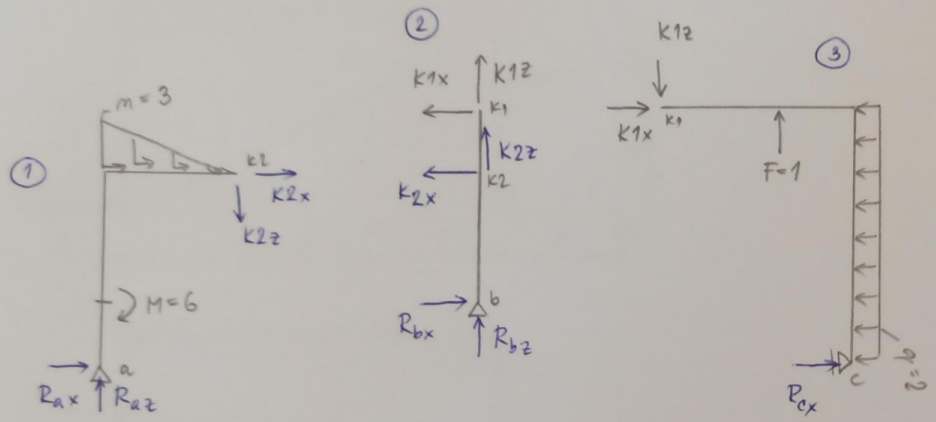
ko: $\sum F_{ix} = 0: \quad R_{ax} + R_{bx} + R_{cx} + \frac{1}{2} n \cdot 2 - q \cdot 4 = 0$

$3{,}75 - 2{,}25 + 3{,}5 + \frac{1}{2} \cdot 3 \cdot 2 - 2 \cdot 4 = 0$ ✓

$\sum F_{iz} = 0: \quad R_{az} + R_{bz} + F = 0$

$2{,}625 + (-3{,}625) + 1 = 0$ ✓

VÝPOČET VNĚJŠÍCH REAKCÍ ROZDĚLENÍM V KLOUBECH:



1) ③ $\Sigma M_{i,K1} = 0$: $\circlearrowleft\oplus$

$F_1 \cdot 2 - q \cdot 4 \cdot 2 + R_{cx} \cdot 4 = 0$

$R_{cx} = \frac{-1 \cdot 2 + 2 \cdot 4 \cdot 2}{4} = \underline{3{,}5\,kN}\ (\rightarrow)$

$\Sigma F_{ix} = 0$: $K1x - q \cdot 4 + R_{cx} = 0$

$\underline{K1x} = -3{,}5 + 2 \cdot 4 = \underline{4{,}5\,kN}$

$\Sigma F_{iz} = 0$: $-K1z + F = 0 \rightarrow \underline{K1z = 1\,kN}$

ko: $\Sigma M_{ic} = 0$: $\circlearrowleft\oplus$

$K1z \cdot 3 - K1x \cdot 4 - F \cdot 1 + q \cdot 4 \cdot 2 = 0$

$1 \cdot 3 - 4{,}5 \cdot 4 - 1 \cdot 1 + 2 \cdot 4 \cdot 2 = 0$ ✓

2) ② $\Sigma M_{i,K2} = 0$: $\circlearrowleft\oplus$

$K1x \cdot 1 + R_{bx} \cdot 2 = 0$

$R_{bx} = \frac{-4{,}5 \cdot 1}{2} = \underline{-2{,}25\,kN\ (\leftarrow)}$

$\Sigma F_{ix} = 0$:

$-K1x - K2x + R_{bx} = 0$

$\underline{K2x} = R_{bx} - K1x = -2{,}25 - 4{,}5 = \underline{-6{,}75\,kN}$

3) ① $\Sigma M_{ia} = 0$ $\circlearrowleft\oplus$:

$-M - \frac{1}{2} \cdot m \cdot 2 \cdot 3 - K2z \cdot 2 - K2x \cdot 3 = 0$

$\underline{K2z} = \frac{-6 - \frac{1}{2} \cdot 3 \cdot 2 \cdot 3 - (-6{,}75) \cdot 3}{2} = \underline{2{,}625\,kN}$

4) ② $\Sigma F_{iz} = 0$: $K1z + K2z + R_{bz} = 0$

$\underline{R_{bz}} = -1 - 2{,}625 = \underline{-3{,}625\,kN\ (\downarrow)}$

5) ① $\Sigma F_{ix} = 0$:

$R_{ax} + \frac{1}{2} \cdot m \cdot 2 + K2x = 0$

$R_{ax} = -\frac{1}{2} \cdot 3 \cdot 2 - (-6{,}75)$

$\underline{R_{ax} = 3{,}75\,kN}$

$\Sigma F_{iz} = 0$:

$R_{az} - K2z = 0$

$\underline{R_{az} = 2{,}625\,kN}\ (\uparrow)$

ko: $\Sigma M_{i,K2} = 0$ $\circlearrowleft\oplus$:

$R_{ax} \cdot 3 - R_{az} \cdot 2 - M = 0$

$3{,}75 \cdot 3 - 2{,}625 \cdot 2 - 6 = 0$ ✓