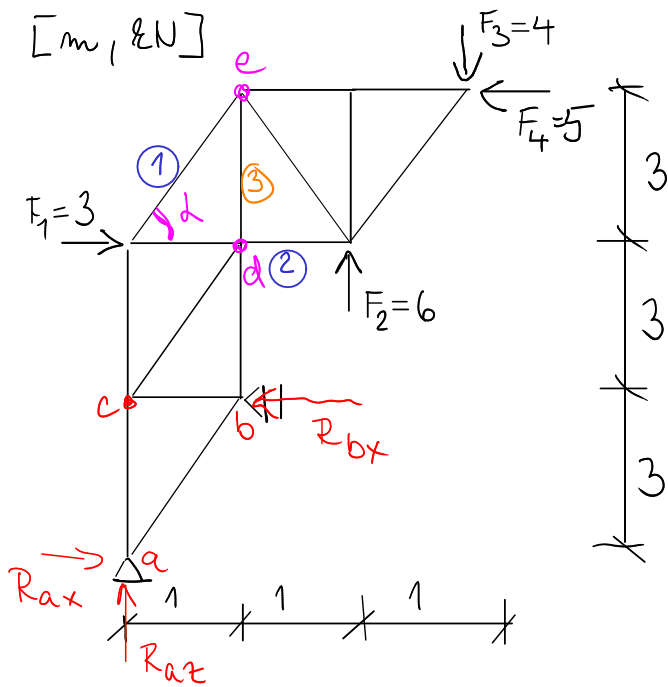




JMÉNO:

$$l = \sqrt{3^2 + 1^2} = \sqrt{10}$$

$$\sin \alpha = \frac{3}{\sqrt{10}}$$

$$\cos \alpha = \frac{1}{\sqrt{10}}$$

$$\sum F_{zi} = 0 \oplus \uparrow R_{az} - F_3 + F_2 = 0 \Rightarrow R_{az} = 4 - 6 = -2 \text{ kN}$$

$$\sum M_{ai} = 0 \oplus \uparrow R_{bx} \cdot 3 - F_1 \cdot 6 + F_2 \cdot 2 - F_3 \cdot 3 + F_4 \cdot 9 = 0$$

$$R_{bx} = -\frac{27}{3} = -9 \text{ kN}$$

$$\sum M_{ci} = 0 \oplus \uparrow R_{ax} \cdot 3 - F_1 \cdot 3 + F_2 \cdot 2 - F_3 \cdot 3 + F_4 \cdot 6 = 0$$

$$R_{ax} = \frac{-21}{3} = -7 \text{ kN}$$

$$\sum F_{xi} = 0 \oplus \rightarrow R_{ax} - R_{bx} + F_1 - F_4 = 0 \checkmark$$

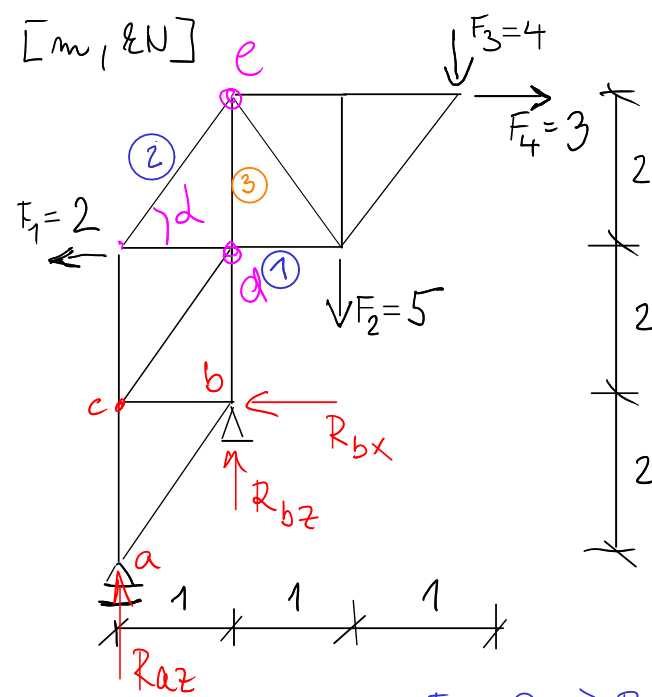
$$\sum M_{ai} = 0 \oplus \uparrow N_{1x} \cdot 3 + F_2 \cdot 1 - F_3 \cdot 2 + F_4 \cdot 3 = 0$$

$$3 N_{1x} \cos \alpha = -F_2 \cdot 1 + F_3 \cdot 2 - F_4 \cdot 3$$

$$N_{1x} = \frac{-13 \cdot \sqrt{10}}{3 \cdot 1} = -13,703 \text{ kN}$$

$$\sum M_{ci} = 0 \oplus \uparrow N_2 \cdot 3 - F_2 \cdot 1 + F_3 \cdot 2 = 0 \Rightarrow N_2 = -\frac{2}{3} \text{ kN}$$

kontrola: $\sum F_{xi} = 0 \oplus \leftarrow N_{1x} + 5 + N_2 = 0 \quad -13,703 \cdot \frac{1}{\sqrt{10}} + 5 - \frac{2}{3} = 0 \checkmark$



JMÉNO:

$$l = \sqrt{2^2 + 1^2} = \sqrt{5}$$

$$\sin \alpha = \frac{2}{\sqrt{5}}$$

$$\cos \alpha = \frac{1}{\sqrt{5}}$$

$$\sum F_{xi} = 0 \oplus \leftarrow F_1 + R_{bx} - F_4 = 0 \Rightarrow R_{bx} = 1 \text{ kN}$$

$$\sum M_{bi} = 0 \oplus \downarrow R_{az} \cdot 1 - F_1 \cdot 2 + F_2 \cdot 1 + F_3 \cdot 2 + F_4 \cdot 4 = 0$$

$$R_{az} = -21 \text{ kN}$$

$$\sum M_{ci} = 0 \oplus \uparrow R_{bz} \cdot 1 + F_1 \cdot 2 - F_2 \cdot 2 - F_3 \cdot 3 - F_4 \cdot 4 = 0$$

$$R_{bz} = +30 \text{ kN}$$

$$\sum F_{zi} = 0 \oplus \uparrow R_{az} + R_{bz} - F_2 - F_3 = 0 \checkmark$$

$$\sum M_{ci} = 0 \oplus \downarrow N_1 \cdot 2 + F_2 \cdot 1 + F_3 \cdot 2 = 0$$

$$N_1 = -\frac{13}{2} = -6,5 \text{ kN}$$

$$\sum M_{di} = 0 \oplus \uparrow N_2 \cdot 2 - F_2 \cdot 1 - F_3 \cdot 2 - F_4 \cdot 2 = 0$$

$$2 N_2 \cos \alpha = F_2 \cdot 1 + F_3 \cdot 2 + F_4 \cdot 2$$

$$N_2 = \frac{19 \cdot \sqrt{5}}{2 \cdot 1} = 21,242 \text{ kN}$$

kontrola: $\sum F_{xi} = 0 \oplus \leftarrow N_{1x} + 5 + N_2 = 0 \quad -6,5 + 21,242 \cdot \frac{1}{\sqrt{5}} - 3 = 0 \checkmark$