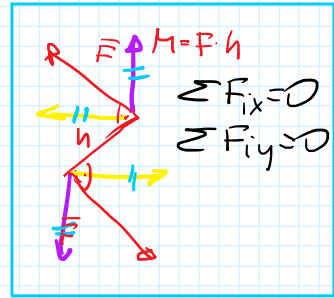


PANE:
 $\bar{P}_1, \bar{P}_2, \bar{P}_3, \bar{P}_4$
 $P_1 = P_2 = P_3 = P_4 = P$
 $M = 1Pa$
 $1a$

SUKCAME:
 $\bar{R}_A \rightarrow \bar{R}_{Ax}, \bar{R}_{Ay}$
 \bar{R}_B

KONTROLA ZNAKOW DO SIŁ ZEWNĘTRZNYCH



RZĄSKA DO WOLNEJ UKŁAD SIŁ
 WARTOŚCI RÓWNOWAŻY:

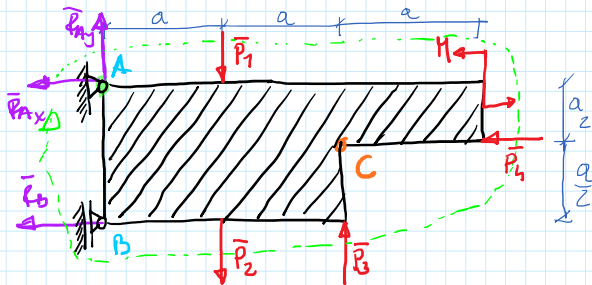
$$\begin{cases} \Sigma F_{ix} = 0 \\ \Sigma F_{iy} = 0 \\ \Sigma M_{i_A} = 0 \end{cases} \Rightarrow \begin{cases} -R_{Ax} + 0 + 0 + 0 - P_1 + 0 + 0 - R_B = 0 \\ 0 + R_{Ay} - P_1 + 0 + 0 + P_3 - P_2 + 0 = 0 \\ R_{Ax} \cdot 0 + R_{Ay} \cdot 0 - P_1 \cdot a + M - P_4 \cdot \frac{a}{2} + P_3 \cdot 2a - P_2 \cdot a - R_B \cdot a = 0 \end{cases}$$

$$\begin{cases} -R_{Ax} - P_1 - R_B = 0 \\ R_{Ay} - P_1 + P_3 - P_2 = 0 \\ -P_1 \cdot a + M - P_4 \cdot \frac{a}{2} + P_3 \cdot 2a - P_2 \cdot a - R_B \cdot a = 0 \end{cases} \Rightarrow \begin{cases} R_{Ax} = -P_1 - P_4 = -\frac{1}{2}P - P = -\frac{3}{2}P \\ R_{Ay} = P \\ R_B \cdot a = P \cdot a (-1 + 1 - 0.5 + 2 - 1) = P \cdot a \cdot 0.5 \\ R_B = \frac{1}{2}P \end{cases}$$

$$\begin{aligned} R_{Ax} &= -\frac{3}{2}P \\ R_{Ay} &= +P \\ R_B &= +\frac{1}{2}P \end{aligned}$$

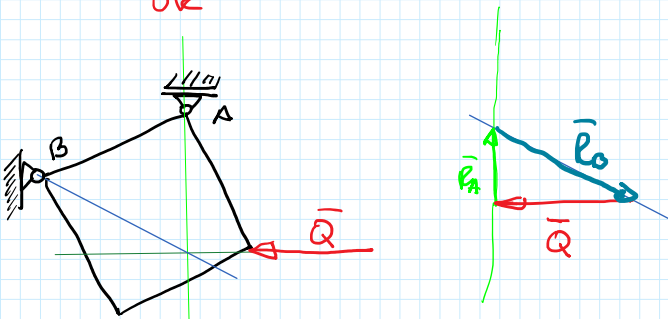
SPRAWDZENIE:

$$\Sigma M_{i_C} = 0$$



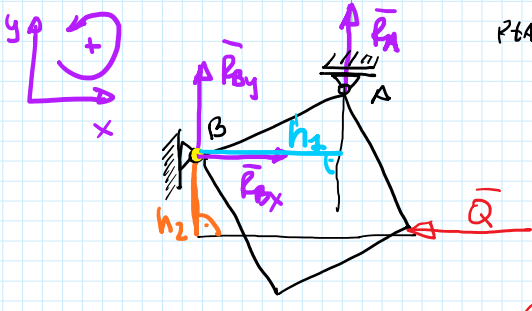
$$\begin{aligned} \Sigma M_{i_C} &= +R_{Ax} \cdot \frac{a}{2} - R_{Ay} \cdot 2a + P_1 \cdot a + M + P_4 \cdot 0 + P_3 \cdot 0 + P_2 \cdot a - R_B \cdot \frac{a}{2} = 0 \\ -\frac{3}{2}P \cdot \frac{a}{2} - P \cdot 2a + Pa + Pa + Pa - \frac{1}{2}P \cdot \frac{a}{2} &= 0 \\ Pa \left(-\frac{3}{4} - 2 + 1 + 1 + 1 - \frac{1}{4} \right) &= 0 \\ Pa \cdot 0 &= 0 \end{aligned}$$

OK



RZĄSKA DO WOLNEJ UKŁAD SIŁ
 WARTOŚCI RÓWNOWAŻY:

$$\begin{cases} \Sigma F_{ix} = 0 \\ \Sigma F_{iy} = 0 \\ \Sigma M_{i_B} = 0 \end{cases} \Rightarrow \begin{cases} -Q + R_{Bx} = 0 \\ R_A + R_{By} = 0 \\ +R_A \cdot h_1 - Q \cdot h_2 = 0 \end{cases}$$



$$\left\{ \begin{array}{l} R_{Bx} = Q \\ R_A = Q \frac{h_2}{h_1} \\ R_{By} = -R_A = -Q \frac{h_2}{h_1} \end{array} \right.$$

$$R_B = \sqrt{R_{Bx}^2 + R_{By}^2}$$