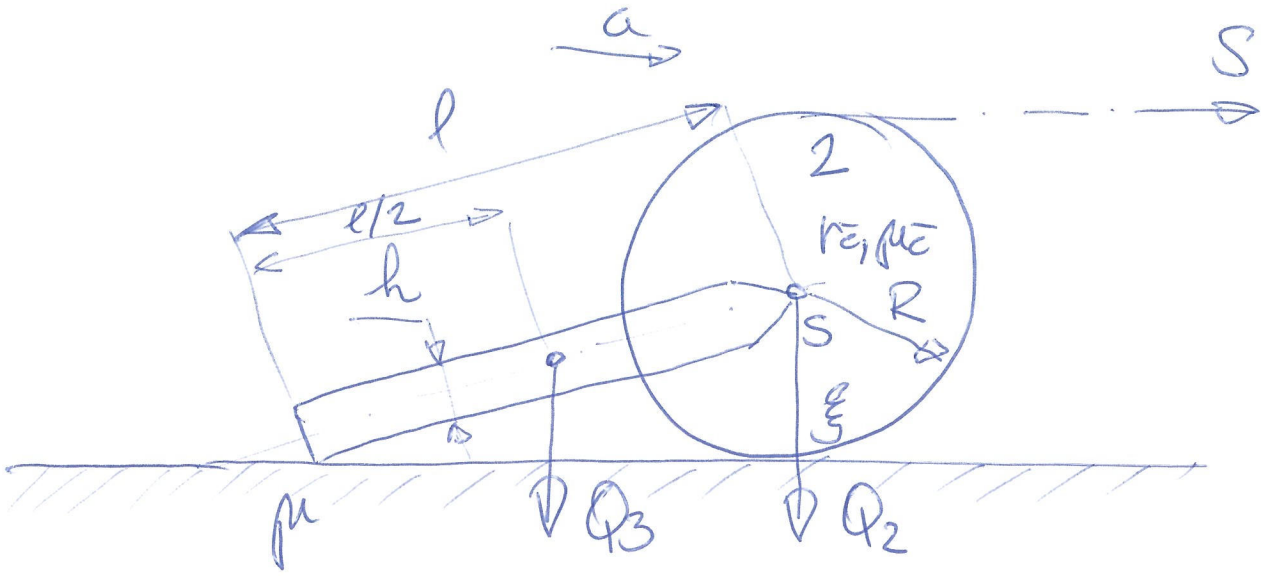


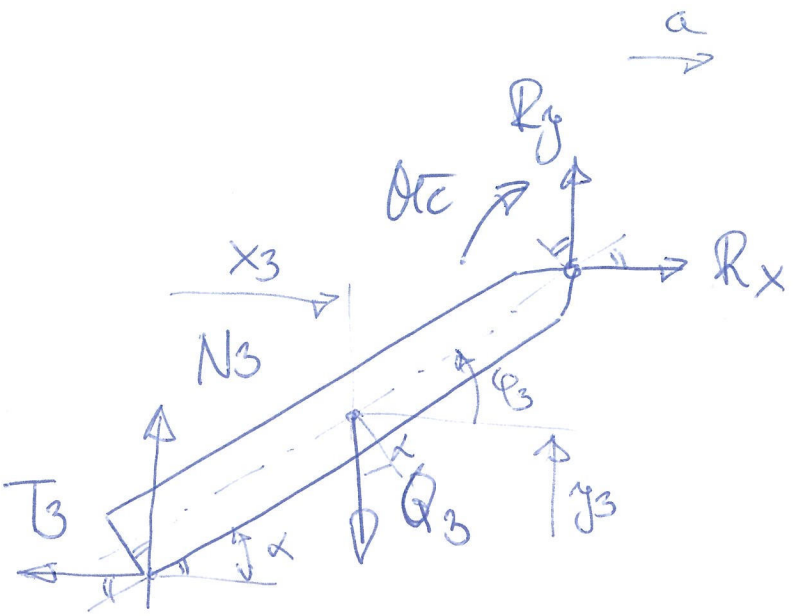
D: $Q_2 = 10^4\ N$ $\quad l = 1{,}3\ m$ $\quad \xi = 0{,}02\ m$

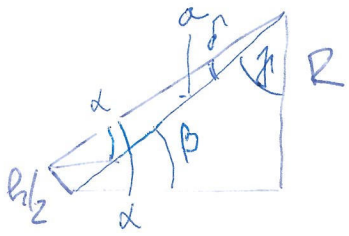
$Q_3 = 5\,10^3\ N$ $\quad R = 0{,}5\ m$ $\quad \mu = 0{,}6$

$I_{S_2} = 1{,}2 \cdot 10^3\ kg\,m^2$ $\quad h = 0{,}2\ m$ $\quad a = 0{,}5\ m\,s^{-2}$

$r_c = 0{,}08\ m$, $\mu_c = 0{,}2$

U: S pro $a = konst.$





$$\sin\beta = \frac{R}{a} \qquad \cos\beta = \frac{R}{a}$$

$$a^2 = l^2 + \left(\frac{h}{2}\right)^2 \qquad \pi/2 - \beta = \beta$$

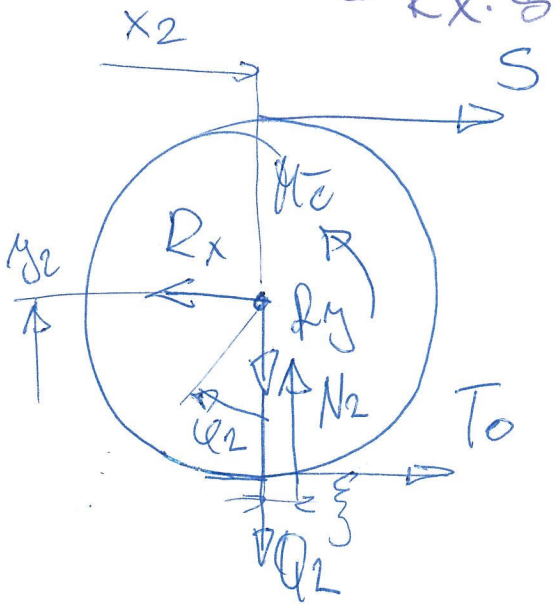
$$\operatorname{tg}\delta = \frac{h/2}{l}$$

$$\alpha = \frac{\pi}{2} - \beta - \delta$$

$$m_3 \cdot \ddot{x}_3 = R_x - T_3, \quad T_3 = |N_3| \cdot \mu \qquad \ddot{y}_3 = 0 \qquad \ddot{\varphi}_3 = 0$$

$$m_3 \cdot \ddot{y}_3 = R_y - Q_3 + N_3$$

$$I_{3S3} \cdot \ddot{\varphi}_3 = R_y \cdot \cos\alpha \cdot \frac{l}{2} - N_3 \cos\alpha \cdot \frac{l}{2} + N_3 \sin\alpha \cdot \frac{R}{2} - R_x \cdot \sin\alpha \cdot \frac{l}{2} - T_3 \cos\alpha \cdot \frac{h}{2} - T_3 \sin\alpha \cdot \frac{l}{2}$$



$$m_2 \cdot \ddot{x}_2 = S + T_o - R_x$$

$$m_2 \cdot \ddot{y}_2 = N_2 - Q_2 - R_y$$

$$I_{2S2} \ddot{\varphi}_2 = S \cdot R - T_o \cdot R - M_c - N_2 \cdot \xi$$

$$M_c = r_c \cdot \mu_c \cdot \sqrt{R_x^2 + R_y^2}$$

linearizace: $M_c = r_c \cdot \mu_2 (0{,}42 R_x + 0{,}96 R_y)$ pro $R_y > R_x$

Řešením:

$$\ddot{x}_3 = a \qquad \ddot{x}_2 = a$$

$$\ddot{y}_3 = 0 \qquad \ddot{y}_2 = 0$$

$$\ddot{\varphi}_3 = 0 \qquad \ddot{\varphi}_2 = \frac{a}{R}$$

S	R_x	R_y	N_3	T_3	N_2	T_0	M_c	
1	-1					1		
		-1			1			
Q					$-\xi$	$-R$	-1	
	1			-1				
		1	1					$= \underline{\underline{A}}$
	$-\frac{l}{2}\sin\alpha$	$\frac{l}{2}\cos\alpha$	$\frac{l}{2}\cos\alpha + \frac{l}{2}\sin\alpha$	$-\frac{l}{2}\cos\alpha - \frac{l}{2}\sin\alpha$				
	$0{,}4\,r_2\mu_2$	$0{,}36\,r_2\mu_2$					-1	(M_2)
			μ	-1				(T_3)

$$= \underline{b}$$

$$\begin{bmatrix} m_2 \ddot{x}_2 \\ m_2 \ddot{y}_2 + Q_2 \\ I_{2S2} \ddot{\varphi}_2 \\ m_3 \ddot{x}_3 - \\ m_3 \ddot{y}_3 + Q_3 \\ I_{3S3} \ddot{\varphi}_3 \\ \emptyset \\ \emptyset \end{bmatrix}$$

$$\underline{A}\,\underline{x} = \underline{b}$$

$$\underline{x} = \underline{\underline{A}}^{-1}\,\underline{b}$$

Přeřadíme

$(\underline{M_a} = \underline{\underline{D}}\,\underline{R} + Q)$