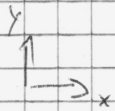


$$D: \begin{aligned} F_1 &= 100 \text{ N} \\ F_2 &= 30 \text{ N} \\ M &= 2 \text{ Nm} \\ a &= 25 \text{ cm} \\ b &= 10 \text{ cm} \end{aligned}$$

$$U: F, \alpha, r$$



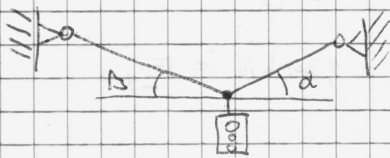
$$\begin{aligned} \sum X: & -F_2 + F \cdot \cos \alpha = 0 \\ \sum Y: & F_1 + F \cdot \sin \alpha = 0 \\ \sum M_A: & F_1 \cdot \frac{a}{2} + F_2 \cdot b + M - F \cdot r = 0 \end{aligned} \quad \left. \vphantom{\sum} \right\} \Rightarrow \begin{aligned} F_x &= F_2 \\ F_y &= -F_1 \end{aligned}$$

$$F = \sqrt{F_x^2 + F_y^2} = 100 \text{ N}$$

$$\operatorname{tg} \alpha = \frac{F_y}{F_x} = 73,3^\circ$$

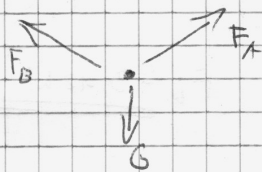
$$r = \frac{F_1 \cdot \frac{a}{2} + F_2 \cdot b + M}{F} = 0,168 \text{ m}$$

Vuolňovací metoda



$$D: \begin{aligned} m &= 220 \text{ kg} \\ d &= 25^\circ \\ \beta &= 20^\circ \end{aligned}$$

$$U: F_A, F_B$$



$$\begin{aligned} \sum X: & F_A \cdot \cos \alpha - F_B \cdot \cos \beta = 0 \\ \sum Y: & F_A \cdot \sin \alpha + F_B \cdot \sin \beta - G = 0 \end{aligned}$$

$$G = m \cdot g$$

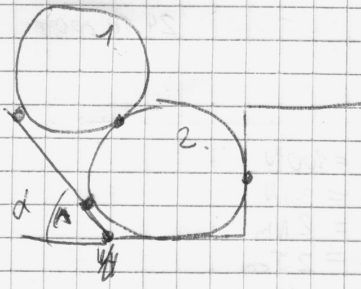
$$F_B = F_A \cdot \frac{\cos \alpha}{\cos \beta}$$

$$F_A \sin \alpha + F_A \frac{\cos \alpha}{\cos \beta} \sin \beta - m \cdot g = 0$$

$$F_A = \frac{m \cdot g}{\sin \alpha + \frac{\cos \alpha}{\cos \beta} \sin \beta}$$

$$F_A = 2,87 \text{ kN}$$

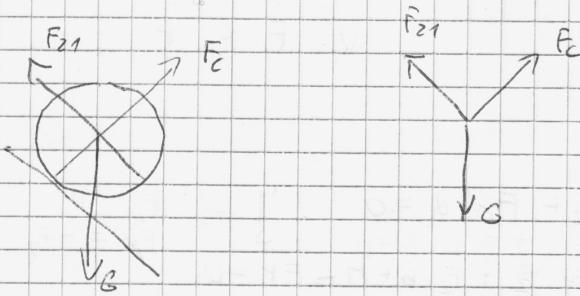
$$F_B = 2,77 \text{ kN}$$



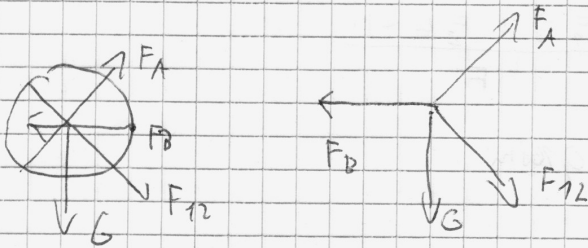
D: $m = 200 \text{ kg}$, $\alpha = 65^\circ$

V: F_A, F_B, F_C

1.



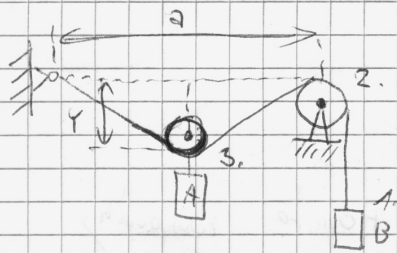
2.



1. \vec{x} : $F_C \cdot \cos \alpha - F_{21} \cdot \cos \alpha = 0$
 \vec{y} : $-mg + F_C \sin \alpha + F_{21} \cdot \sin \alpha = 0$
 $F_C = F_{21}$ $F_C = \frac{m \cdot g}{2 \sin \alpha} = 7,39 \text{ kN} = F_{21}$

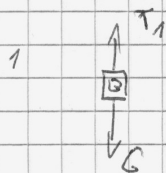
2. \vec{x} : $-F_B + F_{12} \cdot \cos \alpha + F_A \cdot \cos \alpha = 0$
 \vec{y} : $-mg + F_A \sin \alpha - F_{12} \cdot \sin \alpha = 0$

$F_A = \frac{mg + F_{12} \cdot \sin \alpha}{\sin \alpha} = \underline{\underline{4,16 \text{ kN}}}$ $F_B = \underline{\underline{3,02 \text{ kN}}}$

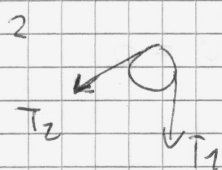


$D: m_A = 50 \text{ kg}$
 $m_B = 75 \text{ kg}$
 $a = 10 \text{ m}$

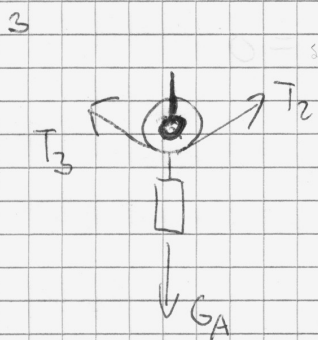
$v: \downarrow$



$\uparrow: T_1 - m \cdot g = 0$
 $T_1 = m \cdot g$



$T_1 = T_2$



$T_2 = T_3$

$\vec{x}: T_2 \cdot \cos \alpha - T_3 \cdot \cos \alpha = 0$

$\uparrow: -m_A \cdot g + T_2 \cdot \sin \alpha + T_3 \cdot \sin \alpha = 0$

$-m \cdot g + 2 T_2 \cdot \sin \alpha = 0$

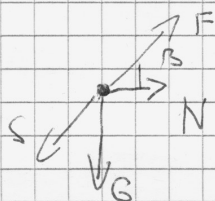
$\Rightarrow \alpha = 19,5^\circ$

$\tan \alpha = \frac{x}{a} \Rightarrow 1,77 \text{ m}$



$D: m, k, l_0, l, \alpha, \beta$

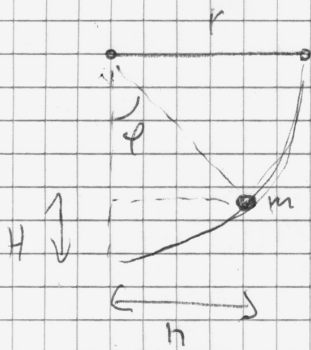
$v: F, \text{ runde } \text{wenn } \text{wichtig}$



$\vec{x}: F \cdot \cos \beta + N - S \cdot \cos \alpha = 0$

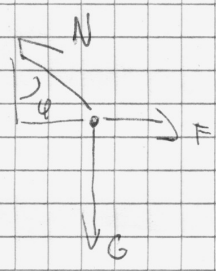
$\uparrow y: -m \cdot g + F \cdot \sin \beta - S \cdot \sin \alpha = 0$

$F = \frac{m \cdot g + k \cdot (l - l_0) \cdot \sin \alpha}{\sin \beta}$



$O: m, F, h$

$U: \varphi, h, \text{konice rovnováhy}$



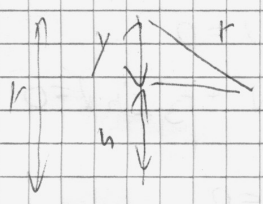
$$\vec{x}: r - N \cdot \sin \varphi = 0$$

$$\vec{y}: -m \cdot g + N \cdot \cos \varphi = 0$$

$$N = \frac{F}{\sin \varphi}$$

$$-mg + F \cdot \frac{\cos \varphi}{\sin \varphi} = 0$$

$$\frac{F}{mg} = \tan \varphi$$



$$h = r - y$$