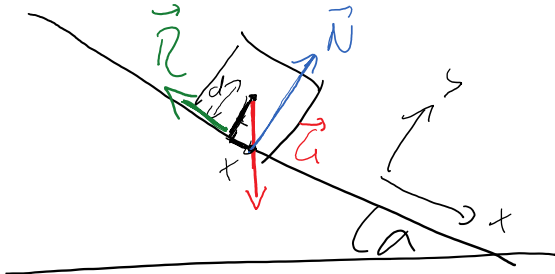


Klotz auf schiefer Ebene



Kräfte-Gleichgewicht $\sum \vec{F} = 0$

$$\begin{aligned} y: N &= G \cdot \cos \alpha \\ x: R &= G \sin \alpha \end{aligned}$$

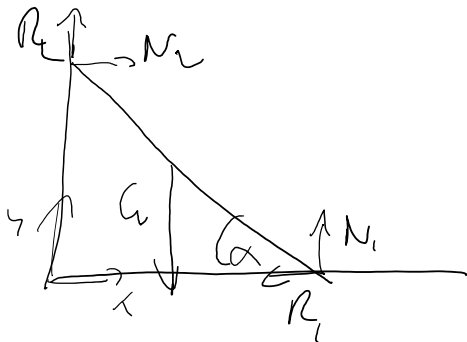
$$\sum \vec{M}_s = 0$$

$$d \cdot R = x \cdot N$$

$$d \cdot G \sin \alpha = x \cdot G \cos \alpha$$

$$\frac{x}{d} = \tan \alpha$$

Leiter an der Wand



$$x: R_1 = N_2 \quad \Rightarrow \quad G = N_1 + R_2$$

$$\underline{R_2 = G - N_1}$$

Drehmoment

$$R_2 \cdot l \cos \alpha + N_2 \cdot l \sin \alpha = G \cdot \frac{l}{2} \cos \alpha$$

$$(G - N_1) \cdot l \cos \alpha + R_1 \cdot l \sin \alpha = G \cdot \frac{l}{2} \cos \alpha$$

$$G \left(\cos \alpha - \frac{\cos \alpha}{2} \right) = N_1 \cos \alpha - R_1 \sin \alpha$$

$$\frac{\cos \alpha}{2}$$

$$\underline{G} = N_1 - R_1 \tan \alpha$$

$$R_1 \leq \mu_1 N_1$$

\bar{z}

$$\leq N_1 - \mu_1 N_1 \tan \alpha$$

$$\frac{G}{2} \leq N_1 (1 - \mu_1 \tan \alpha)$$

$$N_1 \geq \frac{G}{2(1 - \mu_1 \tan \alpha)} \geq \frac{N_1 (1 + \mu_1 \mu_2)}{2(1 - \mu_1 \tan \alpha)}$$

$$N_1 = G - R_2 \geq G - \mu_2 N_2 = G - \mu_2 G \geq G - \mu_2 \mu_1 N_1$$

$$N_1 (1 + \mu_1 \mu_2) \geq G$$

$$1 = \frac{(1 + \mu_1 \mu_2)}{2(1 - \mu_1 \tan \alpha)} \rightarrow 2 - 2\mu_1 \tan \alpha = 1 + \mu_1 \mu_2$$

$$\frac{1 - \mu_1 \mu_2}{2\mu_1} = \tan \alpha$$