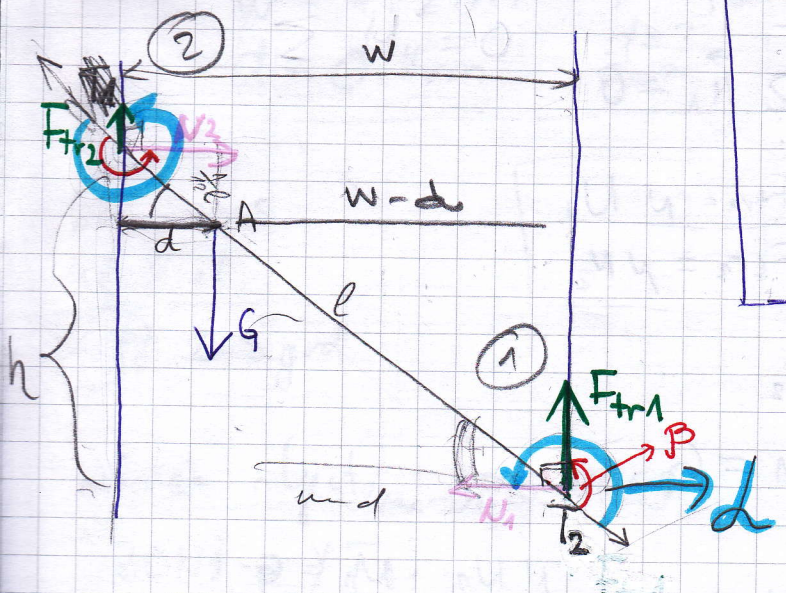
4) SKICA:



ZADANO

$m = 70\,kg$ Traži se ~~d~~ h

$w = 1.2\,m$

$d = 0.1$ $\quad \frac{w}{l} = \cos\alpha$

$\mu_1 = 1.1$ $\quad l = \frac{w}{\cos\alpha}$

$\mu_2 = 0.7$

Zbog sličnost trokuta $\left|\frac{T_1 A}{T_1 T_2}\right| = \frac{d}{w} = \frac{0.1}{1.2} = \frac{1}{12}$

$|AT_1| = \frac{1}{12} l$

$|AT_2| = \frac{11}{12} l$

2 UVJETA: ① $\Sigma F_i = 0$

② $\Sigma M_i = 0$

① sile u smjeru x-osi → $N_1 = N_2$

sile u smjeru y-osi → $F_{tr1} + F_{tr2} = G$

$\mu_1 N_1 + \mu_2 N_2 = mg$ iz $N_1 = N_2$ slijedi

$N_1 (\mu_1 + \mu_2) = mg$

$N_1 = \frac{mg}{\mu_1 + \mu_2} = \frac{70 \cdot 9.81}{1.1 + 0.7} = 381.5\,N \rightarrow N_2 = 381.5\,N$

$F_{tr1} = N_1 \mu_1 = 419.65\,N$

$F_{tr2} = N_1 \mu_2 = 267.05\,N$

② $M = r \times F = |r| \cdot |F| \sin\alpha$

$M_G + M_{N1} + M_{Ftr1} + M_{N2} + M_{Ftr2} = 0$

$0 + |AT_2| \cdot N_1 \cdot \sin\alpha + |AT_2| \cdot F_{tr1} \cdot \sin(\alpha - \frac{\pi}{2}) + |AT_1| \cdot N_2 \cdot \sin(\alpha) + |AT_1| F_{tr2} \cdot \sin(\alpha + \frac{\pi}{2}) = 0$

$\frac{11}{12} l \cdot N_1 \cdot \sin\alpha + \frac{11}{12} l N_1 \cdot \mu_1 \sin(\alpha - \frac{\pi}{2}) + \frac{1}{12} l (N_1 \sin(\alpha) + \frac{1}{12} l \cdot N_1 \mu_2 \sin(\alpha + \frac{\pi}{2}) = 0 \quad | \cdot \frac{12}{l \cdot N_1}$

$11 \sin\alpha + 11 \cdot 1.1 (-\cos\alpha) + \sin\alpha + 0.7 \cos(\alpha) = 0$

$12 \sin\alpha = 12.1 - 0.7 \cos\alpha \quad | : 12$

$\sin\alpha = \cos\alpha \cdot \frac{11.4}{12} \quad | : \cos\alpha$

$\operatorname{tg}\alpha = 0.95 \rightarrow \alpha = 43.53119929 \rightarrow l = \frac{w}{\cos\alpha} = \frac{1.2}{\cos 43.53} = 1.65511737\,m$

$\operatorname{tg}\alpha = \frac{h}{w} \Rightarrow h = \operatorname{tg}\alpha \cdot w = 0.95 \cdot 1.2 = 1.14\,m$ (↓ 0.72499)