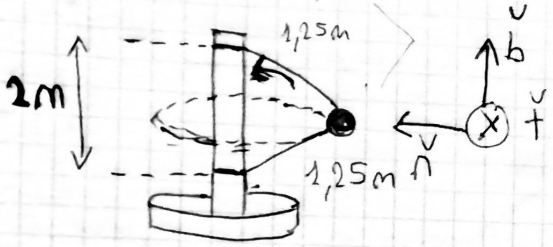
19) $m = 4\,Kg$; $\vec{\Omega} = cte$

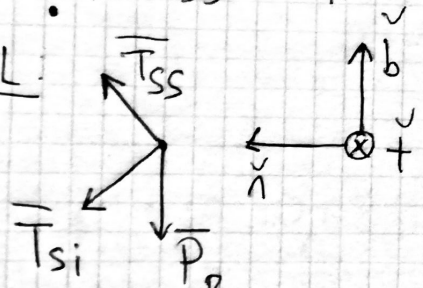


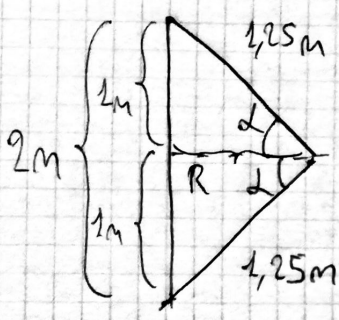
$\check{b} = \check{t} \times \check{n}$

$\check{k} = \underset{\check{i}}{\check{X}} \times \underset{\check{j}}{\check{Y}}$

a) $\overline{T}_{Si} = ?$ / $T_{SS} = 70\,N$

DCL:





$\text{sen}\,\alpha = \frac{CO}{H} = \frac{1m}{1,25m} = 0,8$

$\alpha = 53°$

$1,25m^2 = R^2 + 1m^2$

$\sqrt{1,25m^2 - 1m^2} = R$

$0,75m = R$

- Sist. de ref inercial
- 2da ley de Newton:

b) $T_{SS_b} - T_{Si_b} - P_B = m\,a_b = 0$

$T_{SS}\,\text{sen}\,\alpha - T_{Si}\,\text{sen}\,\alpha - m\,g = 0$

$70N \quad 0,8 \qquad 0,8 \quad 4kg \quad 9,8\frac{m}{s^2}$

$\rightarrow T_{Si} = 21\,N$

a) $T_{ss}\cos\alpha + T_{si}\cos\alpha = m a_n$

$70N \cdot 0,6 + 21N \cdot 0,6 = m \cdot \underbrace{\Omega^2 R}_{0,75}$

b) $T_{si} \cdot \sin\alpha = 21N \cdot 0,8 = 16,8N$

a) $T_{si} \cdot \cos\alpha = 21N \cdot 0,6 = 12,6N$

$\Rightarrow \boxed{T_{si} = 12,6N\ \check{a} \blacksquare 16,8N\ \check{b}}$

b) $\vec{\Omega} = ?$

$\Omega = 4,26 \frac{rad}{s}$

$= 4,26 \frac{\frac{1}{2\pi} rev}{\frac{1}{60} min}$

$\boxed{\vec{\Omega} = 40,68\ rpm\ \check{b}}$

$\cdot \vec{V} = \vec{\Omega} \times \vec{r}$

$|\vec{V}| = \Omega \cdot R$

$a_n = \frac{V^2}{R}$

$\Rightarrow \cdot \frac{|\vec{V}|^2}{R} = \frac{\Omega^2 R^2}{R} = \Omega^2 R$

c) b) $T_{ss}\underbrace{\sin\alpha}_{0,8} - \underbrace{T_{si}}_{0}\underbrace{\sin\alpha}_{0,8} - \underbrace{P_B}_{39,2N} = 0$

$T_{ss} \cdot 0,8 = 39,2N$

$\boxed{T_{ss} = 49N}$

$\check{n}$) $T_{SS} \cdot \cos\alpha + T_{Si} \cdot \cos\alpha = m \, a_n$

(T_{SS} = 49N, $\cos\alpha$ = 0,6, T_{Si} = 0, $\cos\alpha$ = 0,6, m = 4kg, $a_n = \Omega^2 R$, R = 0,75m)

$$\Omega = 3,13 \frac{rad}{s}$$

$$= 3,13 \frac{\frac{1}{2\pi} rev}{\frac{1}{60} min}$$

$$\boxed{\vec{\Omega} = 29,89 \text{ rpm} \ \check{b}}$$