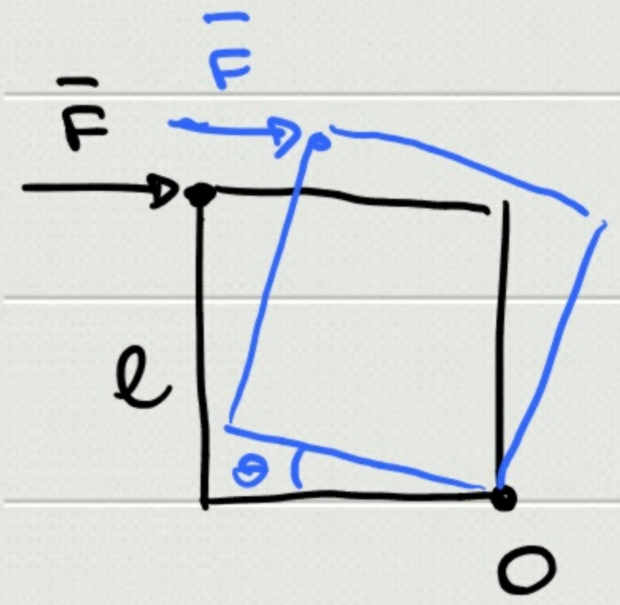


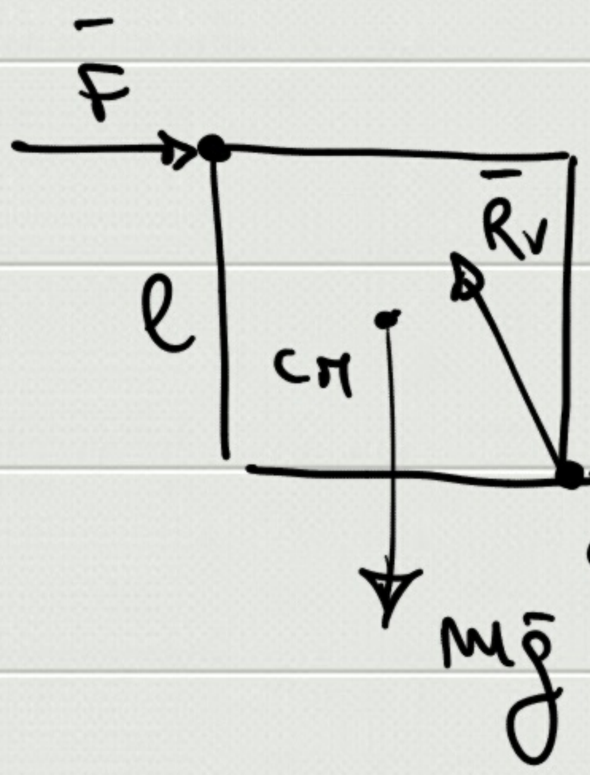
$$l = 1.2\ m$$

$$m = 4 \cdot 10^3\ kg$$

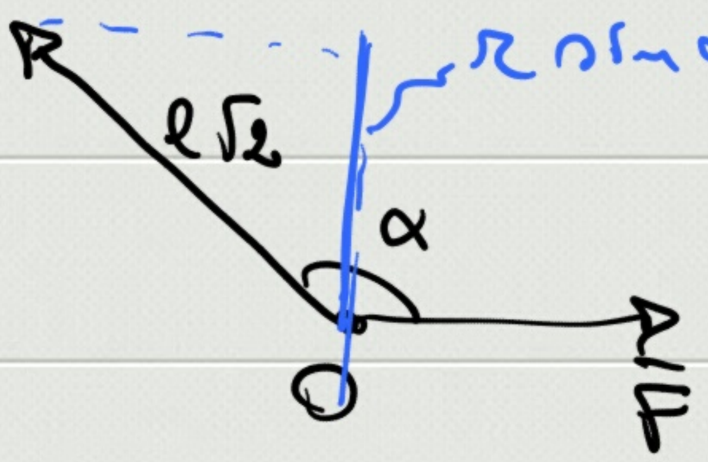
$$F = 2 \cdot 10^4\ N$$

$\alpha(t=0) = ?$

$$\boxed{\bar{M}_0^{\varepsilon} = \bar{I}_z \bar{\alpha}} \quad \Rightarrow \quad \alpha(t_0) = \frac{M_0^{\varepsilon}(t_0)}{I_z}$$



$$\bar{M}_0 = \bar{r} \times \bar{F} = r F \sin\alpha\ \bar{u}_n$$

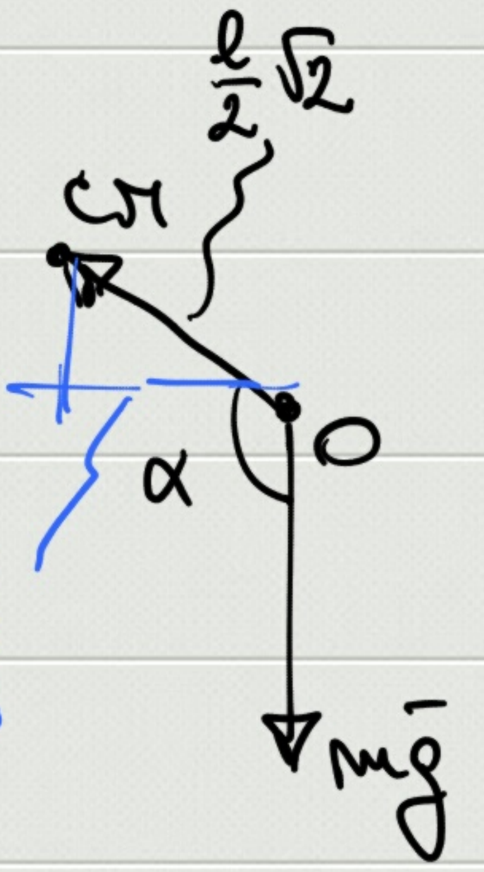


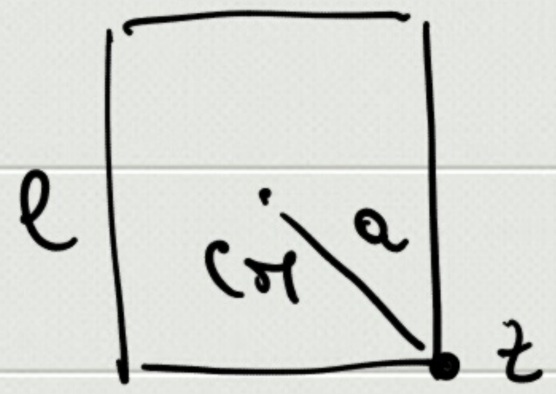
$$M_0 = l F \sqrt{2}$$

$$M_0 = l F - \frac{l}{2} mg$$

$$M_0 = l F \sqrt{2} - \frac{l}{2} mg \sqrt{2}$$

$$M_0 = l F + \frac{l}{2} mg$$





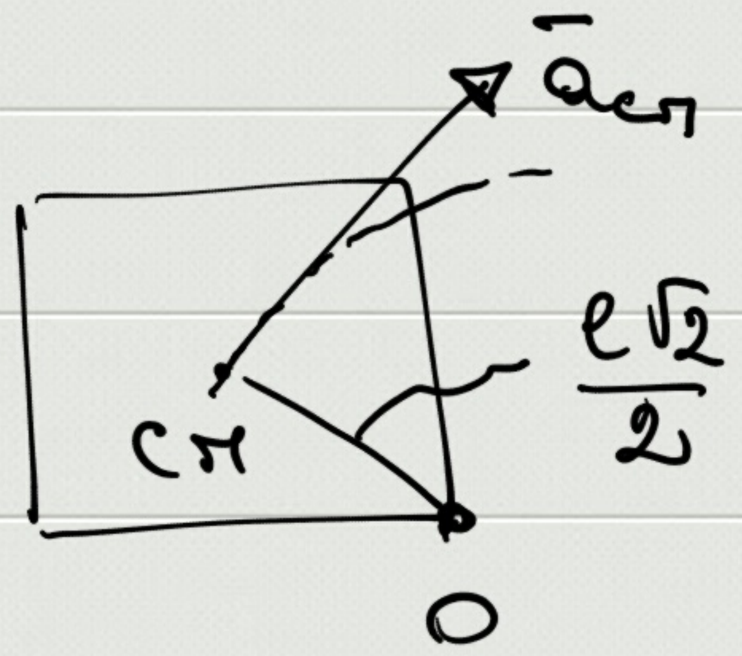
$$I_z = I_{z'} + m a^2$$

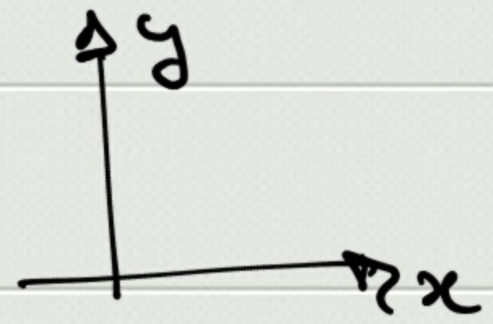
$$= \frac{1}{6} m l^2 + m \frac{l^2}{2} = \frac{2}{3} m l^2$$

$$\alpha(t_0) = \frac{M_0}{I_z} = \frac{6F - 3mg}{4ml} = 0,125 \ rad/s^2$$

$R_V = ?$

$$\bar{R}^e = m\bar{g} + \bar{F} + \bar{R}_V = m\bar{a}_{CM} \qquad a_{CM} = \alpha \frac{l\sqrt{2}}{2}$$





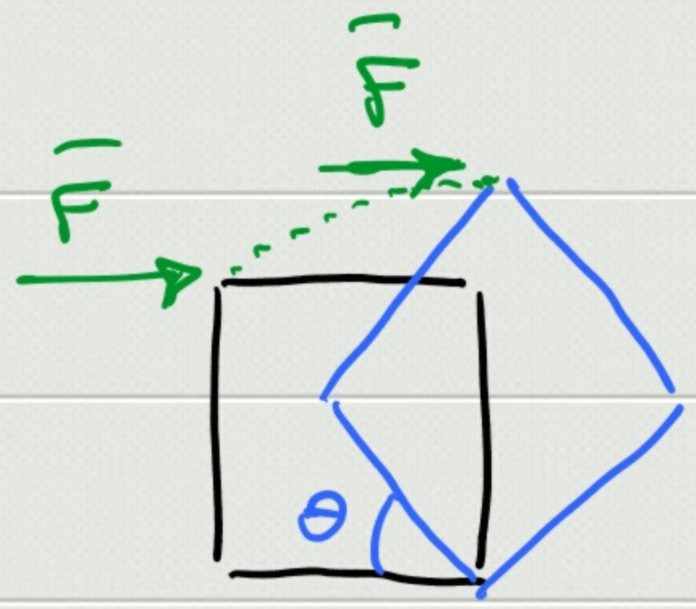
$$x: \quad F + R_{Vx} = m a_{CM,x} = m\alpha \frac{l\sqrt{2}}{2} \frac{\sqrt{2}}{2} = m\alpha \frac{l}{2}$$

$$y: \quad -mg + R_{Vy} = m a_{CM,y} = m\alpha \frac{l\sqrt{2}}{2} \frac{\sqrt{2}}{2} = m\alpha \frac{l}{2}$$

$$R_{rx} = m\alpha\frac{\ell}{2} - F = 1{,}97 \cdot 10^4 \text{ N}$$

$$R_{ry} = m\alpha\frac{\ell}{2} + mg = 3{,}95 \cdot 10^4 \text{ N}$$

$W_F(\theta = 45°) = ?$



$$W_F = F\,\ell\,\sqrt{2}\,\frac{\pi}{4}$$

$$W_F = F\ell\frac{\sqrt{2}}{2}$$

$$W_F = F\ell \quad *$$

$$W_F = 0$$

$\vec{F} = F\,\vec{u}_x$

$$W = \int \vec{F}\,d\vec{s} = \int_0^\ell F\,dx$$

$$= F\ell$$

$$= 2{,}4 \cdot 10^4 \text{ J}$$

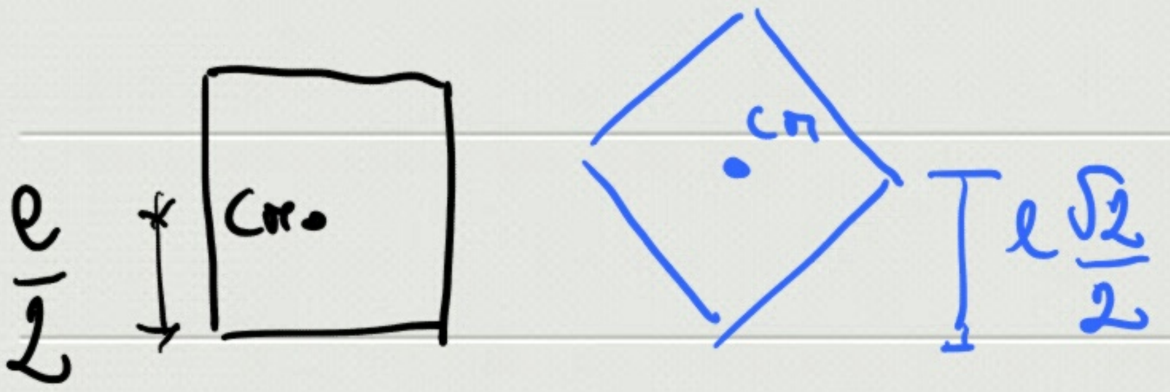
$\omega(\vartheta = 45°) = ?$

$E_{K_i} = 0$

$W_{TOT} = \Delta E_K = \frac{1}{2} I_z \omega^2$

$= W_F + W_{peso}$

$= -\Delta E_{p,peso}$



$$-\Delta E_p = -\left(mg\frac{\ell\sqrt{2}}{2} - mg\frac{\ell}{2}\right) = -mg\ell\left(\frac{\sqrt{2}}{2} - 1\right)$$

$$\Rightarrow \quad F\ell + mg\frac{\ell}{2}\left(1-\sqrt{2}\right) = \frac{1}{2} I_z \omega^2$$

$$\Rightarrow \quad \omega = \sqrt{\frac{3\left[2F - mg\left(\sqrt{2}-1\right)\right]}{2m\ell}} = 2{,}72 \text{ rad/s}$$