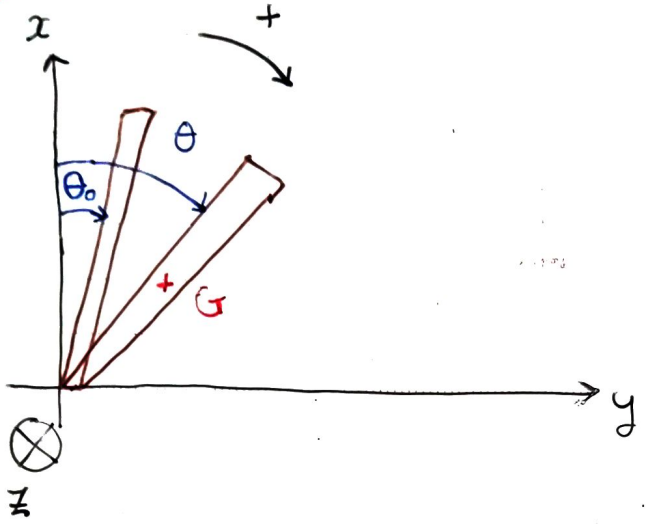
EXP SOL ROT

3/1



TMC sur (O_z)

EXT SOL ROT

3/1 suite

$$J\ddot{\theta} = +mg_0 \frac{L}{2}\sin\theta$$

3/2

$$\frac{1}{2}J\dot{\theta}^2 = -mg_0\frac{L}{2}\cos\theta + C$$

on a $\theta = -mg_0\frac{L}{2}\cos\theta_0 + C \Leftrightarrow C = mg_0\frac{L}{2}\cos\theta_0$

d'où

$$\dot{\theta} = \sqrt{\frac{-mg_0\frac{L}{2}\cos\theta + mg_0\frac{L}{2}\cos\theta_0}{\frac{1}{2}J}}$$

$$= \sqrt{\frac{3g_0}{L}(\cos\theta_0 - \cos\theta)}$$

3/3.

$$\dot{\theta} = \frac{d\theta}{dt} = \sqrt{\frac{3g_0}{L}}\sqrt{\cos\theta_0 - \cos\theta}$$

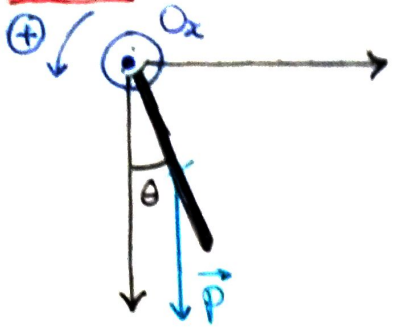
3/4 $\Leftrightarrow$

$$\int_{\theta_0}^{\pi/2} \frac{d\theta}{\sqrt{\cos\theta - \cos\theta_0}} = \int_0^{t_c} \sqrt{\frac{3g_0}{L}}\,dt$$

$$\Leftrightarrow \quad 5{,}1\,s = \sqrt{\frac{3g}{L}}\,t_c$$

$$\Leftrightarrow \quad 5{,}1\,s = \sqrt{\frac{30}{30}}\,t_c = t_c$$

1/1



$$E_c = \frac{1}{2} J_{O_x} \dot{\theta}^2$$