17

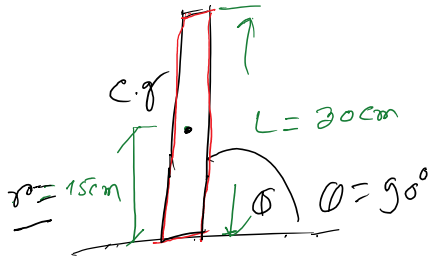
04 May 2021 19:10

ruler length $L = 30cm = 0.3m$

$r = 15cm = 0.15m$

$m = 300g = 0.3kg$

$\theta = 90°$



α = Angular acceleration

$I = \frac{1}{3}ML^2$

AS force due to gravity produces Torque

$Mg\sin\theta \cdot r = \frac{1}{3}ML^2 \cdot \alpha$

$\alpha = \frac{Mg\sin\theta \cdot r}{\frac{1}{3}ML^2}$

$= \frac{g\sin\theta \cdot r}{\frac{1}{3}L^2}$

$= \frac{9.81 m/s^2 \cdot \sin 90° \cdot 0.15m}{\frac{1}{3}\cdot (0.3m)^2}$

$= 49.05 \ rad/s^2$

(At the top end of the ruler. The same acceleration at middle of the ruler and at the end of the Ruler.)