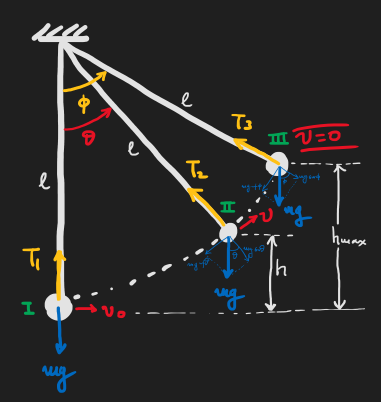


12. II



$$\begin{aligned} \text{Geωα: } \frac{\text{η ποσ.}}{\text{μολ.}} &= \frac{l-h}{l} \Rightarrow \\ \text{Geωα} &= \frac{l-h}{l} \Rightarrow \\ \rightarrow l \cdot \text{Geωα} &= l-h \Rightarrow h = l - l \cdot \text{Geωα} \Rightarrow \\ \rightarrow h &= l(1-\text{Geωα}) \end{aligned}$$

Θέμα I: $\sum F_{\text{ακτ.}} = F_k \Rightarrow T_1 - mg = m \frac{v_0^2}{l} \Rightarrow T_1 = mg + m \frac{v_0^2}{l}$

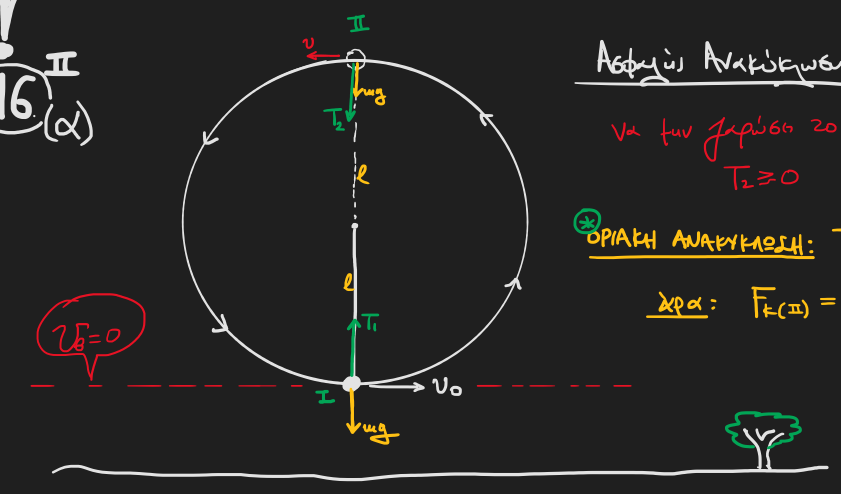
ΑΔΜΕ (I → II): $K_I + U_I = K_{II} + U_{II} \Rightarrow \frac{1}{2} m v_0^2 = m g h_{\text{max}} \Rightarrow h_{\text{max}} = \frac{v_0^2}{2g} \Rightarrow \text{Geωφ} = \frac{l - h_{\text{max}}}{l}$

Θέμα III: $\sum F_{\text{ακτ.}} = F_k \Rightarrow T_3 - mg \text{Geωφ} = m \frac{v^2}{l} \Rightarrow T_3 = mg \text{Geωφ} + m \frac{v^2}{l}$

ΑΔΜΕ (I → II): $K_I + U_I = K_{II} + U_{II} \Rightarrow \frac{1}{2} m v_0^2 = \frac{1}{2} m v^2 + m g h \xrightarrow{-2} v^2 = v_0^2 + 2gh \Rightarrow v^2 = v_0^2 - 2gh \Rightarrow v = \sqrt{v_0^2 - 2gh}$

Θέμα II: $\sum F_{\text{ακτ.}} = F_k \Rightarrow T_2 - mg \text{Geωθ} = m \frac{v^2}{l} \Rightarrow T_2 = mg \text{Geωθ} + m \frac{v^2}{l} \quad (\text{Geωθ} = \frac{l-h}{l})$

! 16. II (α)



Ασφαλή Αντικείμενα:

να τυν γυρῶσα 20 v0 hα
T2 ≥ 0

⊕ ΟΡΙΑΚΗ ΑΝΑΚΥΚΛΩΣΗ: T2 = 0

λπα: Fk(II) = mg

Θέμα II: $\sum F_{\text{ακτ.}} = F_k \Rightarrow$

$$\Rightarrow mg + T_2 = m \frac{v^2}{l} \Rightarrow$$

$$\Rightarrow mg + 0 = m \frac{v^2}{l} \Rightarrow$$

$$\Rightarrow v^2 = gl \Rightarrow v = \sqrt{gl}$$

Ελάχιστη ταχύτητα
στο άνω σημείο
για να κάνει οριακή
κυκλική κίνηση

ΑΔΜΕ: I → II: $K_I + U_I = K_{II} + U_{II} \Rightarrow$

$$\Rightarrow \frac{1}{2} m v_0^2 = \frac{1}{2} m v^2 + m g 2l \xrightarrow{-2} v_0^2 = v^2 + 4gl \xrightarrow{v=\sqrt{gl}} v_0^2 = \sqrt{gl}^2 + 4gl \Rightarrow$$

$$\Rightarrow v_0^2 = gl + 4gl = 5gl \Rightarrow v_0 = \sqrt{5gl}$$