

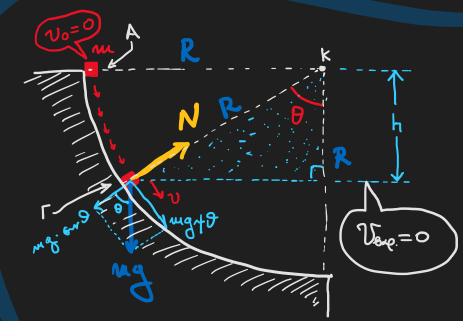
Τρ 1.12.20

B+2



22 ΦII

- I → $\wedge$ ($T_A = T_B$) → ω ίδιο ω $\leftarrow$
 - II → $\wedge$ ($f_A = f_B$) → ω ίδιο ω $\leftarrow$
 - III → Σ ($v = \omega R, R_B > R_A$) → v ίδιο v $\leftarrow$
 - IV → Σ ($\omega = 2\pi f = 2\pi/T$) → ω ίδιο ω $\leftarrow$
 - V → $\wedge$ ($\alpha = \omega^2 R, R_A < R_B$) → α ίδιο α $\leftarrow$
 - VI → $\wedge$ ($\vec{S}_B > \vec{S}_A, R_B > R_A$) → $\vec{S}$ ίδιο $\vec{S}$ $\leftarrow$
- $\alpha = \frac{v^2}{R} = \frac{(\omega R)^2}{R} = \frac{\omega^2 R^2}{R} = \omega^2 R$
-



$$\sin \theta = \frac{h}{R} \Rightarrow h = R \sin \theta \quad (1)$$

$$\text{ΑΔΜΕ (A} \rightarrow \Gamma): \cancel{K_A} + U_A = K_\Gamma + U_\Gamma \Rightarrow$$

$$\Rightarrow \cancel{mg} h = \frac{1}{2} m v^2 \Rightarrow$$

$$\Rightarrow v = \sqrt{2gh} \quad (2)$$

$$\Sigma F_{\text{κεν}} = F_c \Rightarrow N - mg \sin \theta = m \frac{v^2}{R} \Rightarrow$$

$$\stackrel{(1)}{\stackrel{(2)}}{\Rightarrow} N - mg \sin \theta = m \frac{\sqrt{2gh}^2}{R} \Rightarrow$$

$$\Rightarrow N - mg \sin \theta = m \frac{2gh \sin \theta}{R} \Rightarrow$$

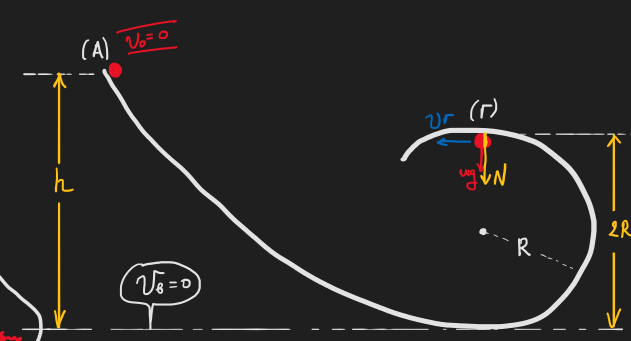
$$\Rightarrow N = mg \sin \theta + m 2g \sin \theta \Rightarrow$$

$$\Rightarrow \boxed{N = 3mg \sin \theta}$$

15 ΦII

11 ΦII

$m = 2 \text{ kg}$
 $h = 20 \text{ m}$
 $R = 7.5 \text{ m}$
 $g = 10 \text{ m/s}^2$
 $\Gamma: \begin{cases} v = ? \\ N = ? \end{cases}$
! κ.ρ.ο.: $h_{\text{min}} = 2.5R$
 για ασφαλή ανακάλυψη



Στο Γ: $\Sigma F_{\text{κεν}} = F_c \Rightarrow mg + N = m \frac{v_\Gamma^2}{R} \Rightarrow$
 $\Rightarrow 2 \cdot 10 + N = 2 \frac{10^2}{7.5} \Rightarrow 20 + N = 26.6 \Rightarrow$
 $\Rightarrow \boxed{N = 6.6 \text{ N}}$

ΑΔΜΕ (A → Γ)
 $\cancel{K_A} + U_A = K_\Gamma + U_\Gamma \Rightarrow$
 $\Rightarrow \cancel{mg} h = \frac{1}{2} m v_\Gamma^2 + \cancel{mg} 2R \Rightarrow$
 $\Rightarrow 2gh = v_\Gamma^2 + 4gR \Rightarrow$
 $\Rightarrow 2gh - 4gR = v_\Gamma^2 \Rightarrow$
 $\Rightarrow 2 \cdot 10 \cdot 20 - 4 \cdot 10 \cdot 7.5 = v_\Gamma^2 \Rightarrow$
 $\Rightarrow v_\Gamma^2 = 400 - 300 = 100 \Rightarrow$
 $\Rightarrow \boxed{v_\Gamma = 10 \text{ m/s}}$

ΟΡΙΑΚΗ ΑΝΑΚΑΛΥΨΗ

$N = 0$
 $\Sigma F_{\text{κεν}} = mg + N = mg \Rightarrow$
 $\cancel{mg} \frac{v^2}{R} = \cancel{mg} \Rightarrow v^2 = gR \Rightarrow \boxed{v = \sqrt{gR}}$
 η κριτική ταχύτητα στο Γ
 ώστε το σώμα να είναι
 ασφαλή ανακάλυψη
 ($N = 0 \rightarrow F_c = mg$)

ΑΔΜΕ (A → Γ): $\cancel{K_A} + U_A = K_\Gamma + U_\Gamma \Rightarrow$
 $\Rightarrow \cancel{mg} h_{\text{min}} = \frac{1}{2} m v^2 + \cancel{mg} 2R \Rightarrow$
 $\Rightarrow gh_{\text{min}} = \frac{1}{2} \sqrt{gR}^2 + g \cdot 2R \Rightarrow$
 $\Rightarrow gh_{\text{min}} = \frac{1}{2} gR + g \cdot 2R \Rightarrow$
 $\Rightarrow h_{\text{min}} = \frac{1}{2} R + 2R \Rightarrow \boxed{h_{\text{min}} = 2.5R}$



H.W.

23
24
25