Πα 4·12·20

B+2

1ο ΓΕΛ ΣΑΛΑΜΙΝΑΣ

H.W.: 18, 20

• θα ξεκινήσουμε με την 12 (μαζί)

23 ΦΙΙ

$R_2 = 4R_1$, $T_2 = 2T_1$, α_{K1}; α_{K2}

$\alpha_K = \frac{\upsilon^2}{R}$, $\upsilon = \frac{2\pi R}{T}$ $\rightarrow$ $\alpha_K = \frac{\left(\frac{2\pi R}{T}\right)^2}{R} = \frac{\frac{4\pi^2 R^2}{T^2}}{R} \Rightarrow \boxed{\alpha_K = \frac{4\pi^2 R}{T^2}}$

$$\alpha_{K2} = \frac{4\pi^2 R_2}{T_2^2} = \frac{4\pi^2 4R_1}{(2T_1)^2} = \frac{4\pi^2 \cdot 4R_1}{4T_1^2} = \frac{4\pi^2 R_1}{T_1^2} = \alpha_{K1}$$

άρα: $\alpha_{K2} = \alpha_{K1} \rightarrow$ (Α.)

24 ΦΙΙ

$R_1 = R_2$, $F_{K2} = 4\cdot F_{K1}$, T_1; T_2

$F_K = m\frac{\upsilon^2}{R}$, $\upsilon = \frac{2\pi R}{T}$ $\rightarrow$ $F_K = m\frac{\left(\frac{2\pi R}{T}\right)^2}{R} = m\frac{\frac{4\pi^2 R^2}{T^2}}{R} = m\frac{4\pi^2 R}{T^2}$

$$F_{K2} = 4F_{K1} \Rightarrow m\frac{4\pi^2 R_2}{T_2^2} = 4 m\frac{4\pi^2 R_1}{T_1^2} \Rightarrow \frac{1}{T_2^2} = 4\frac{1}{T_1^2} \Rightarrow$$

$$\Rightarrow T_1^2 = 4\cdot T_2^2 \xrightarrow{\sqrt{\cdots}} \boxed{T_1 = 2T_2} \Rightarrow \boxed{T_2 = \frac{1}{2}T_1} \rightarrow \text{(A)}$$

21 ΦΙΙ

(επίπεδο βαρ. δυν. ενεργειών: η θέση 1)

ΑΔΜΕ (1→2): $K_1 + U_1 = K_2 + U_2 \Rightarrow \frac{1}{2}m\upsilon_1^2 = \frac{1}{2}m\upsilon_2^2 + mg\cdot 2\ell \Rightarrow$

$$\xRightarrow{\cdot 2} \upsilon_1^2 = \upsilon_2^2 + 4g\ell \Rightarrow \boxed{\upsilon_1^2 - \upsilon_2^2 = 4g\ell} \quad (1)$$

$$\Sigma F_{\alpha\kappa\tau 1} = F_{K1} \Rightarrow T_1 - mg = m\frac{\upsilon_1^2}{\ell} \Rightarrow \boxed{T_1 = mg + m\frac{\upsilon_1^2}{\ell}} \quad (2)$$

$$\Sigma F_{\alpha\kappa\tau 2} = F_{K2} \Rightarrow T_2 + mg = m\frac{\upsilon_2^2}{\ell} \Rightarrow \boxed{T_2 = m\frac{\upsilon_2^2}{\ell} - mg} \quad (3)$$

$$T_1 - T_2 \overset{(2)}{\underset{(3)}{=}} mg + m\frac{\upsilon_1^2}{\ell} - \left(m\frac{\upsilon_2^2}{\ell} - mg\right) = mg + m\frac{\upsilon_1^2}{\ell} - m\frac{\upsilon_2^2}{\ell} + mg =$$

$$= 2mg + \frac{m}{\ell}(\upsilon_1^2 - \upsilon_2^2) \overset{(1)}{=} 2mg + \frac{m}{\ell}\cdot 4g\ell =$$

$$= 2mg + 4mg \Rightarrow \boxed{T_1 - T_2 = 6mg}$$

25 ΦΙΙ

$\upsilon_1 = 2\upsilon_2$, $R_2 = 2R_1$, $T_1 = 24h$, $T_2 = ?$

$$\upsilon_1 = 2\upsilon_2 \Rightarrow \frac{2\pi R_1}{T_1} = 2\frac{2\pi R_2}{T_2} \Rightarrow$$

$$\Rightarrow \frac{R_1}{24} = 2\frac{2R_1}{T_2} \Rightarrow$$

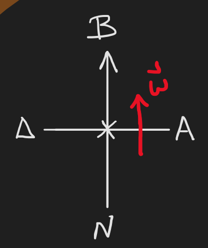
$$\Rightarrow \frac{1}{24} = \frac{4}{T_2} \Rightarrow T_2 = 4\cdot 24 \Rightarrow$$

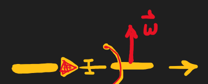
$$\Rightarrow \boxed{T_2 = 96h} \rightarrow \text{(Γ.)}$$

17 ΦΙΙ

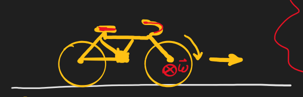
Σωστό το (Α)

το $\vec{\omega}$ δείχνει τον Βορρά





Ποδήλατο από πάνω



Ποδήλατο από το πλάι