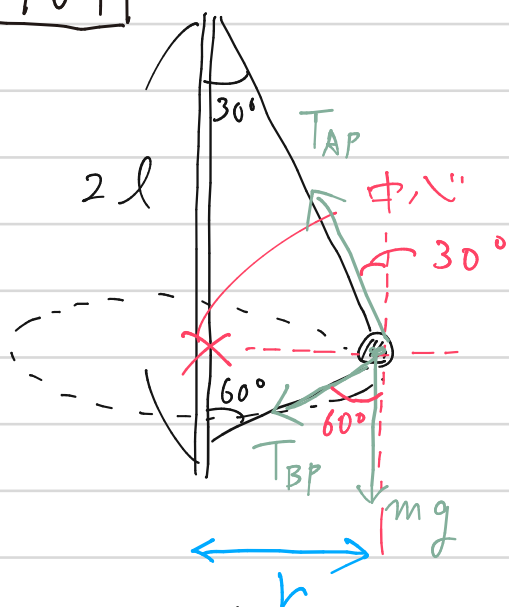


104



(向心力)は

$$T_{AP} \sin 30^\circ + T_{BP} \sin 60^\circ$$

円を中心向き運動方程式

$$m r \omega^2 = F \text{ より}$$

$$m \cdot \frac{2l \cos 30^\circ \sin 30^\circ}{r} \cdot \omega^2 = T_{AP} \sin 30^\circ + T_{BP} \sin 60^\circ$$

$$\Rightarrow \frac{\sqrt{3}}{2} m l \omega^2 = \frac{1}{2} T_{AP} + \frac{\sqrt{3}}{2} T_{BP} \dots \textcircled{1}$$

鉛直はつりあ

$$T_{AP} \cos 30^\circ = T_{BP} \cos 60^\circ + m g$$

$$\Rightarrow \frac{\sqrt{3}}{2} T_{AP} = \frac{1}{2} T_{BP} + m g \dots \textcircled{2}$$

① × √3 と ②

$$\frac{3}{2} m l \omega^2 = \frac{\sqrt{3}}{2} T_{AP} + \frac{3}{2} T_{BP} \dots \textcircled{1}'$$

② × ①' = ①' × ②

$$\frac{3}{2} m l \omega^2 = \frac{1}{2} T_{BP} + m g + \frac{3}{2} T_{BP}$$

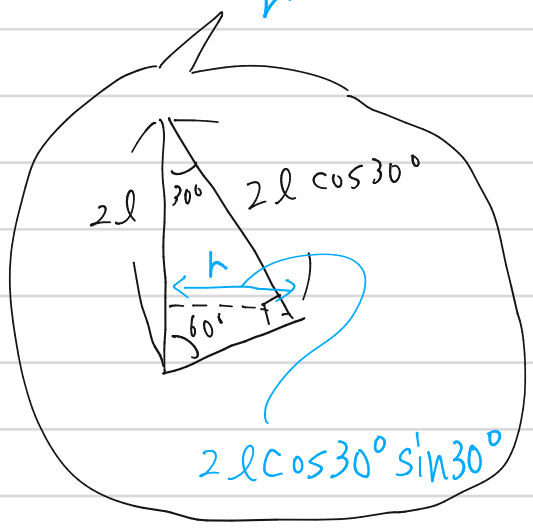
$$T_{BP} = \frac{3}{4} m l \omega^2 - \frac{1}{2} m g$$

$$\omega = 2\pi n \text{ 分の } \omega^2$$

$$T_{BP} = \frac{3}{4} m l (2\pi n)^2 - \frac{1}{2} m g$$

$$T_{BP} = 3\pi^2 m l n^2 - \frac{1}{2} m g$$

$$T_{BP} = \frac{m}{2} (6\pi^2 l n^2 - g)$$



104 続き

② $l = T_{BP}$ を代入して

$$\frac{\sqrt{3}}{2} T_{AP} = \frac{1}{2} \left\{ \frac{m}{2} (6\pi^2 l n^2 - g) \right\} + mg$$

$$\frac{\sqrt{3}}{2} T_{AP} = \frac{m}{4} (6\pi^2 l n^2) - \frac{mg}{4} + mg$$

$$\frac{\sqrt{3}}{2} T_{AP} = \frac{m}{4} (6\pi^2 l n^2 + 3g)$$

$$\frac{\sqrt{3}}{2} T_{AP} = \frac{3m}{4} (2\pi^2 l n^2 + g)$$

$$\therefore T_{AP} = \frac{\sqrt{3}m}{2} (2\pi^2 l n^2 + g) \quad \#$$

* 模範解答と出す
順番が逆に存りました。