

Exercícios de casa resolvidos

Extensivo – Caderno 3 – Física I

Aula 11

9. Resposta: D

ponteiro das **horas**:

$$\omega = \text{cte}$$

$$\gamma = \frac{\Delta\omega}{\Delta t} = \frac{0}{\Delta t} \Rightarrow \gamma = 0$$

$$\omega = \frac{\Delta\varphi}{\Delta t} \Rightarrow \omega = \frac{2\pi}{12} = \frac{\pi}{6} \text{ rad/h}$$

ponteiro dos **minutos**:

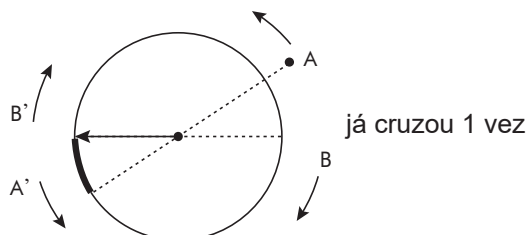
$$\omega = \text{cte} \Rightarrow \gamma = \frac{\Delta\omega}{\Delta t} = \frac{0}{\Delta t} \Rightarrow \gamma = 0$$

$$\omega = \frac{\Delta\varphi}{\Delta t} \Rightarrow \omega = \frac{2\pi}{60} \Rightarrow \omega = \frac{\pi}{12} \text{ rad/min}$$

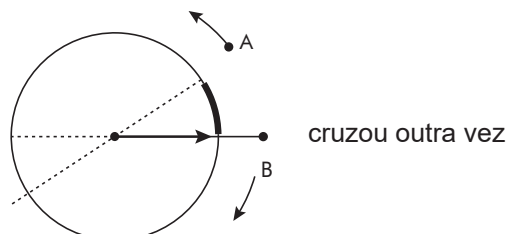
12. Resposta: C

$$\Delta t = 1 \text{ min} \rightarrow \Delta\varphi = 2\pi \text{ rad (1 volta)}$$

$$t = 30 \text{ s}$$



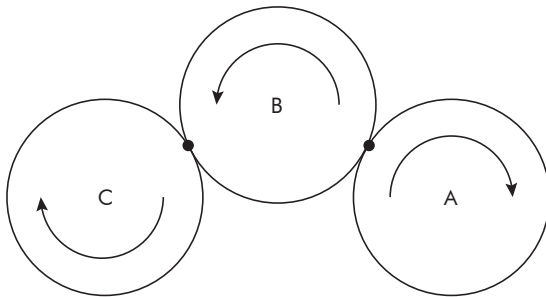
$$t = 60 \text{ s}$$



Exercícios de casa resolvidos

Aula 12

4.



a) horário

$$b) v_A = v_B \Rightarrow \omega_A \cdot R_A = \omega_B \cdot R_B$$

$$\omega = 2\pi \cdot F \Rightarrow F_A \cdot \underbrace{R_A}_{N_A} = F_B \cdot \underbrace{R_B}_{N_B}$$

$$100 \cdot N_A = F_B \cdot N_B$$

$$100 \cdot 50 = v_B$$

$$v_B = 5000 \frac{\text{dentes}}{\text{min}}$$

$$c) v_A = v_B \Rightarrow \omega_A \cdot R_A = \omega_B \cdot R_B \Rightarrow F_A \cdot N_A = F_B \cdot N_B \Rightarrow 100 \cdot 50 = F_B \cdot 100 \Rightarrow F_B = 50 \text{ r.p.m.}$$

7. Resposta: A

$$\gamma = \frac{\Delta\omega}{\Delta t} = \frac{80\pi - 0}{40} \Rightarrow \gamma = 2\pi \text{ rad/s}^2$$

8. Resposta: C

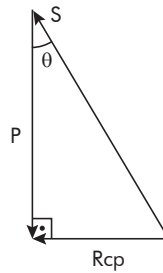
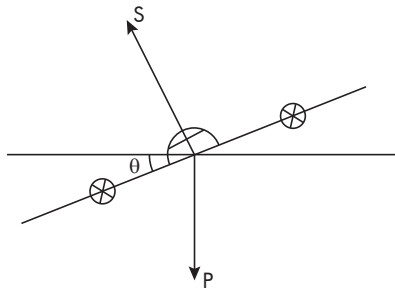
$$\Delta\varphi \stackrel{N}{=} \text{área}$$

$$\Delta\varphi = 1600\pi \text{ rad} \Rightarrow 2\pi \cdot n = 1600\pi \Rightarrow n = 800$$

Exercícios de casa resolvidos

Aula 13

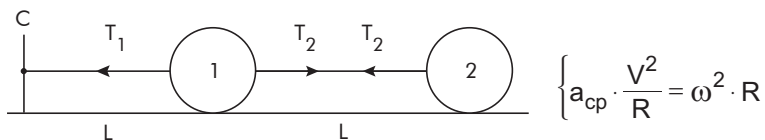
8. Resposta: D



$$\text{tg } \theta = \frac{v^2}{R \cdot g}$$

$$R = \frac{v^2}{g \cdot \text{tg } \theta} \Rightarrow R = \frac{v^2}{g} \cdot \text{cotg } \theta$$

11. Resposta: D



$$T_1 - T_2 = R_{cp1} \Rightarrow T_1 - T_2 = m \cdot \omega^2 \cdot L$$

$$T_2 = R_{cp2} \Rightarrow T_2 = m \cdot \omega^2 \cdot 2L$$

$$T_1 = 3m \cdot \omega^2 \cdot L$$

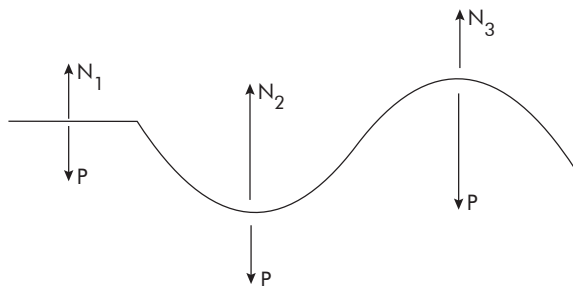
$$\frac{T_1}{T_2} = \frac{3m \cdot \omega^2 \cdot L}{2m \cdot \omega^2 \cdot L} \Rightarrow \frac{T_1}{T_2} = 1,5$$

Obs.: As bolas giram juntas (ω_s iguais).

Exercícios de casa resolvidos

Aula 14

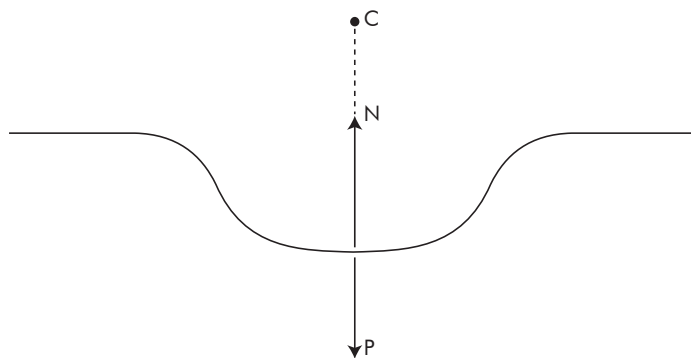
7. Resposta: C



$$N_2 - P = m \cdot \frac{v_2^2}{R_2} \Rightarrow N_2 = P + \frac{m \cdot v_2^2}{R_2} \Rightarrow N_2 > P$$

$$P - N_3 = \frac{m \cdot v_3^2}{R_3} \Rightarrow P = N_3 + \frac{m \cdot v_3^2}{R_3} \Rightarrow P > N_3.$$

9. Resposta: D



$$N - P = m \cdot \frac{v^2}{R} \Rightarrow N - 2 \cdot 10^4 = \frac{2 \cdot 10^3 \cdot 30^2}{400} \Rightarrow N = 24\,500 \text{ N}$$

Ação e reação, ↓ 24 500 N.

Exercícios de casa resolvidos

Aulas 15 e 16

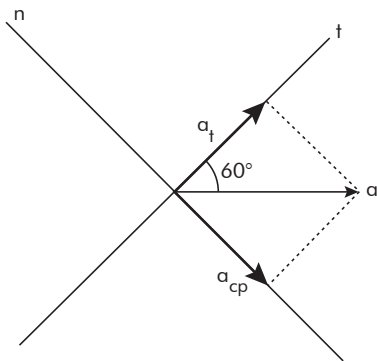
6. Resposta: B

$\vec{a}_n = \vec{a}_{cp} \neq \vec{0} \Rightarrow$ movimento curvilíneo (não necessariamente circular)

$\vec{a}_t \neq \vec{0} \Rightarrow$ movimento variado

\vec{a}_t e \vec{v} sentidos opostos \Rightarrow movimento retardado

7. Resposta: D



$$a_T = a \cdot \cos 60^\circ = 4 \cdot 0,5 \Rightarrow a_T = 2 \text{ m/s}^2$$

$$\text{como } |\alpha| = a_T \Rightarrow \boxed{|\alpha| = 2 \text{ m/s}^2}$$

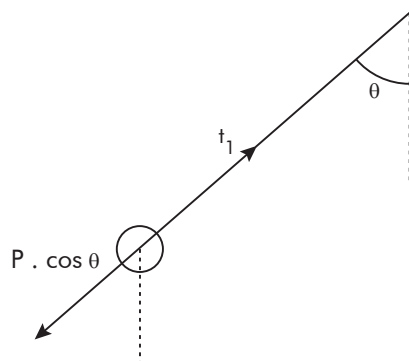
$$a_{cp} = a \cdot \sin 60^\circ \Rightarrow a_{cp} = 4 \cdot \frac{\sqrt{3}}{2} = 2\sqrt{3} \text{ m/s}^2$$

$$a_{cp} = \frac{v^2}{R} \Rightarrow 2\sqrt{3} = \frac{10^2}{R} \Rightarrow \boxed{R \approx 29 \text{ m}}$$

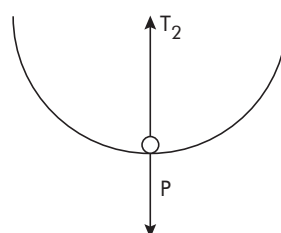
9. Resposta: A

No ponto de inversão:

$$V = 0 \Rightarrow R_{cp} = 0 \Rightarrow T_1 = P \cdot \cos \theta$$



No ponto **mais baixo** da trajetória:



$$T_2 - P = R_{cp}$$

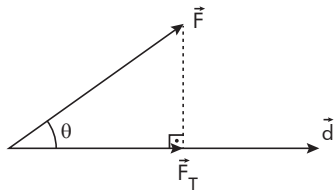
$$T_2 = P + \frac{m \cdot v^2}{R}$$

$$T_2 > T_1$$

Exercícios de casa resolvidos

Aula 17

4. Resposta: A



$$\tau_F = F \cdot d \cdot \cos \theta = \underbrace{F \cdot \cos \theta}_{F_T} \cdot d$$

F_T é a **projeção** da força sobre o deslocamento.

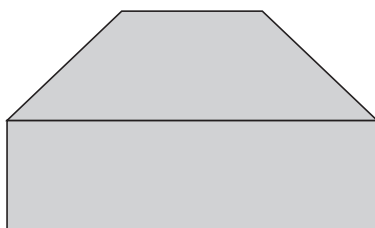
$$\tau = F_T \cdot d$$

Para o mesmo deslocamento, realizará maior trabalho a força que tiver maior projeção (F_T) sobre o deslocamento.

8. Resposta: B

$$\tau \stackrel{N}{=} \text{área}$$

Área do gráfico **até** o eixo **horizontal**.



$$\tau = 120 \text{ J}$$