

Exercícios de casa resolvidos

Extensivo – Caderno 7 – Física I

P. 48 – Aula 33

$$3. \mathcal{E}_{m_i} = m \cdot g \cdot h_i = 1 \cdot 10 \cdot 9 \Rightarrow \mathcal{E}_{m_i} = 90 \text{ J}$$

$$\mathcal{E}_{m_F} = m \cdot g \cdot h_F = 1 \cdot 10 \cdot 4 \Rightarrow \mathcal{E}_{m_F} = 40 \text{ J}$$

$$\Delta \mathcal{E}_m = \mathcal{E}_{m_F} - \mathcal{E}_{m_i} = 40 - 90$$

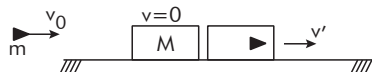
$$\Delta \mathcal{E}_m = -50 \text{ J} \Rightarrow |\Delta \mathcal{E}_m| = 50 \text{ J}$$

Resposta: D

$$4. e = \sqrt{\frac{h}{H}} = \sqrt{\frac{4}{9}} \Rightarrow e = \frac{2}{3}.$$

Resposta: A

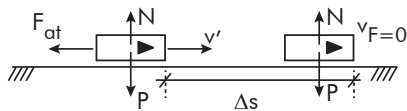
5. No choque, a quantidade de movimento do sistema é conservada.



$$Q_{\text{após}} = Q_{\text{antes}} \Rightarrow (m + M) \cdot v' = m \cdot v_0 + M \cdot 0$$

$$v' = \frac{m \cdot v_0}{m + M} \quad (1)$$

deslocamento do conjunto após o choque:



$$\tau_{\text{total}} = \Delta \mathcal{E}_c (\text{TEC}) \Rightarrow \tau_P + \tau_N + \tau_{F_{\text{at}}} = 0 - \frac{(m+M) \cdot v'^2}{2}$$

$$0 + 0 - \underbrace{\mu \cdot (m+M) \cdot g}_{=N} \cdot \Delta s = 0 - \frac{(m+M) \cdot v'^2}{2}$$

$$v' = \sqrt{2 \cdot \mu \cdot g \cdot \Delta s} \quad (2), \text{ igualando-se } (1) \text{ e } (2), \text{ vem:}$$

$$v_0 = \frac{m+M}{m} \cdot \sqrt{2 \mu \cdot g \cdot \Delta s} = \frac{3005}{5} \cdot \sqrt{2 \cdot 0,2 \cdot 10 \cdot 0,25}$$

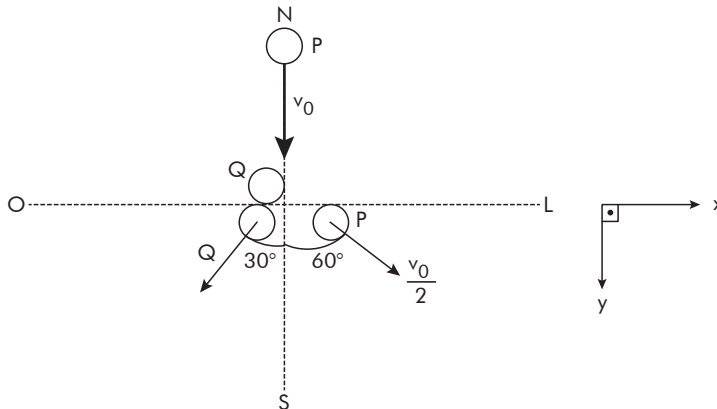
$$v_0 \approx 600 \text{ m/s}$$

Resposta: C

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P. 50 – Aula 34

2.



Considerando a conservação da quantidade de movimento no eixo x , temos:

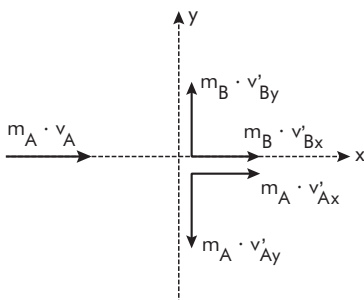
$$Q_{x_{\text{após}}} = Q_{x_{\text{antes}}}$$

$$m \cdot \frac{v_0}{2} \cdot \cos 30^\circ - m \cdot v_Q \cdot \cos 60^\circ = 0$$

$$m \cdot \frac{v_0}{2} \cdot \frac{\sqrt{3}}{2} = m \cdot v_Q \cdot \frac{1}{2} \Rightarrow v_Q = v_0 \cdot \frac{\sqrt{3}}{2}$$

Resposta: C

3.



Conservação da quantidade de movimento na direção x : $Q_{x_{\text{após}}} = Q_{x_{\text{antes}}}$

$$m_B \cdot v'_{Bx} + m_A \cdot v'_{Ax} = m_A \cdot v_A \Rightarrow 3 \cdot 4 \cdot \frac{\sqrt{3}}{2} + 4 \cdot v'_{Ax} = 4 \cdot 5 \Rightarrow v'_{Ax} = \frac{10 - 3 \cdot \sqrt{3}}{2}$$

Conservação da quantidade de movimento na direção y :

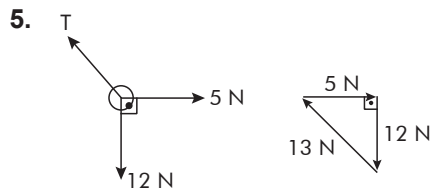
$$Q_{y_{\text{após}}} = Q_{y_{\text{antes}}}$$

$$m_B \cdot v'_{By} - m_A \cdot v'_{Ay} = 0 \Rightarrow m_B \cdot 4 \cdot \frac{1}{2} = m_A \cdot v'_{Ay} \Rightarrow 3 \cdot 2 = 4 \cdot v'_{Ay} \Rightarrow v'_{Ay} = \frac{3}{2}$$

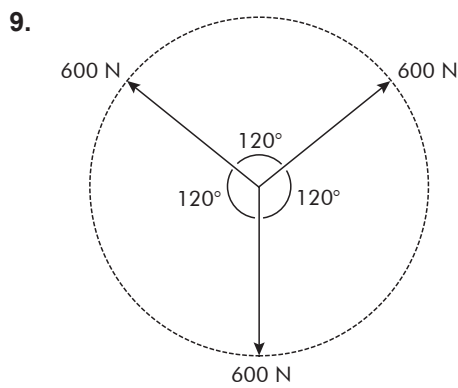
Resposta: A

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P. 53-54 – Aula 35

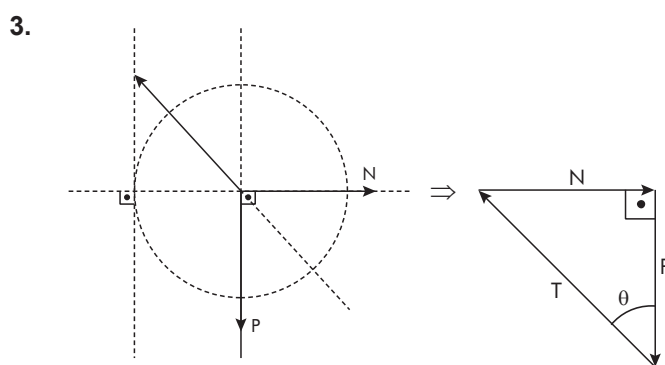


Resposta: D

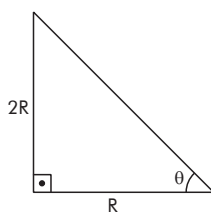


Resposta: D

P. 56 – Aula 36



$$\text{tg } \theta = \frac{N}{P} \quad (1)$$



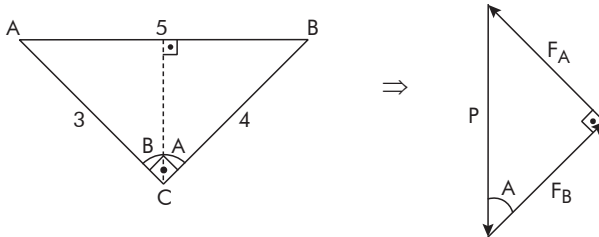
$$\text{tg } \theta = \frac{2R}{R} = 2 \quad (2)$$

Igualando-se (1) e (2), vem: $\frac{N}{P} = 2$

Resposta: B

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5. Observemos inicialmente que o triângulo da figura é da “família” 3, 4, 5.



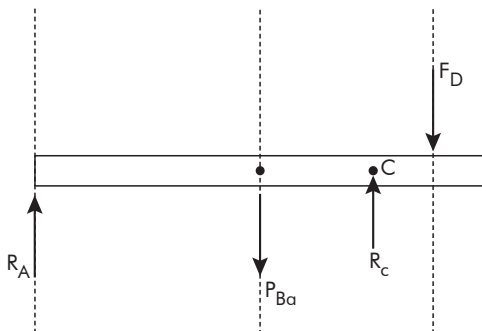
$$F_A = P \cdot \sin A = 200 \cdot \frac{4}{5} \Rightarrow F_A = 160 \text{ N}$$

$$F_B = P \cdot \cos A = 200 \cdot \frac{3}{5} \Rightarrow F_B = 120 \text{ N}$$

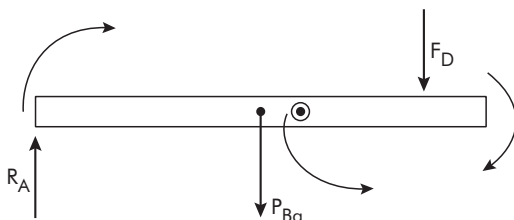
Resposta: B

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4.



A reação no apoio C não é dada nem pedida. Tomemos, portanto, o ponto C como polo.

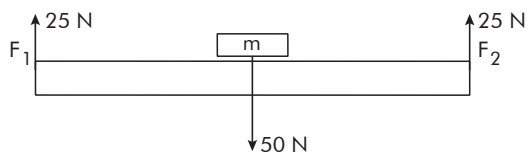


$$R_A \cdot 7 + 30 \cdot 1 = 50 \cdot 1 \Rightarrow R_A = 10 \text{ N}$$

Resposta: D

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5. Se **m** estivesse no meio da tábua, teríamos:



No teste apresentado, temos:

como $F_1 + F_2 = 50\text{ N} \Rightarrow F_1 < 25\text{ N}$

