

# Prueba Física

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## Pregunta 1

- Se aplica Teo Trabajo y energía

DCL =   $P_x = mg \sin 30^\circ$   
 $P_y = mg \cos 30^\circ$

$$\sum F_x = -F_R - mg \sin 30^\circ = ma \rightarrow F_R = \mu N$$
$$\sum F_y = N - mg \cos 30^\circ = 0 \rightarrow N = mg \cos 30^\circ$$

$$ma = -\mu mg \cos 30^\circ - mg \sin 30^\circ$$

$$W_N = \vec{F}_N \cdot \vec{\Delta x} = ma \cdot \Delta x = -(\mu mg \cos 30^\circ + mg \sin 30^\circ) \Delta x$$

$$\text{Teorema Trabajo y energía} = W_N = \Delta K = \frac{1}{2} m v_f^2 - \frac{1}{2} m v_i^2$$

$$= \mu \cdot mg \Delta x \cos 30^\circ + mg \Delta x \sin 30^\circ = \frac{1}{2} m v_f^2$$

$$= \mu \cdot g \Delta x \cos 30^\circ = \frac{v_f^2}{2} - g \Delta x \sin 30^\circ$$

$$= \left( \mu = \frac{1}{g \Delta x \cos 30^\circ} \cdot \left( \frac{v_f^2}{2} - g \Delta x \sin 30^\circ \right) \right)$$

$$= \mu = \frac{1}{9,81 \cdot 3 \cdot \cos 30^\circ} \cdot \left( \frac{64}{2} - 9,81 \cdot 3 \cdot \sin 30^\circ \right) = 0,678$$

$$\mu = 0,68$$

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## Pregunta 2

- conservación del momento

$$2m \cdot 8 \text{ m/s} = m \cdot 20 \text{ m/s} \cdot \cos 34^\circ + mV \cos \theta$$
$$0 = m \cdot 20 \text{ m/s} \cdot \sin 34^\circ + mV \sin \theta$$

$v_x$   
 $v_y$

$$V = \frac{-20 \sin 34^\circ}{\sin \theta}$$

$$16 = 20 \cos 34^\circ - \frac{20 \sin 34^\circ}{\sin \theta} \cdot \cos \theta$$

$$16 = 20 \cos 34^\circ - \frac{20 \sin 34^\circ}{\tan \theta}$$

$$\frac{20 \sin 34^\circ}{\tan \theta} = 20 \cos 34^\circ - 16$$

$$\tan \theta = \frac{20 \sin 34^\circ}{16 - 20 \cos 34^\circ} = 441,05$$

$$\tan^{-1}(441,05) = 89,84^\circ = \theta$$

$$V = -12,036 \text{ m/s}$$

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### Problema 3

a) Perímetro =  $2\pi \cdot 0,4 = 2,513 \text{ [m]}$

$$X \text{ vueltas} = \frac{314 \text{ m}}{2,513 \text{ m}} = 124,936$$

La rueda dio 125 vueltas (Aproximadamente)

$$b) \quad \omega = \frac{2\pi}{T} = 2\pi \left( \frac{129}{30} \right) = 26.2 \frac{\text{Rad}}{\text{s}}$$

$$c) \quad \omega_1 = \omega_2$$

$$R_1 \omega_1 = R_2 \omega_2$$

$$\omega = \frac{0.04 \cdot 26.2}{0.1} = 10.48 \frac{\text{Rad}}{\text{s}}$$