

Prueba N° 4

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①

$$\begin{aligned} M &= 5 \text{ kg} \\ V_i &= 8 \text{ m/s} \\ d &= 3 \text{ m} \\ V_f &= 0 \\ \alpha &= 30^\circ \end{aligned}$$

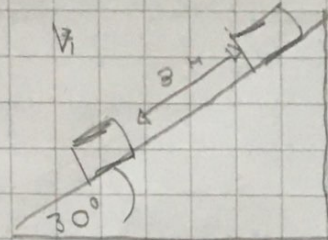
$$\begin{aligned} \sum F_x &= M \cdot a \\ -F_x - F_r &= M \cdot a \end{aligned}$$

$$F_r = M \cdot N$$

$$\begin{aligned} \sum F_y &= 0 \\ F_y &= N \end{aligned}$$

$$\begin{aligned} M \cdot g \cdot \cos \alpha &= N \\ 5 \cdot 10 \cdot \cos 30^\circ &= N \\ 43,30 &= N \end{aligned}$$

$$F_r = 43,30 \text{ N}$$



$$43,30 \text{ N} = 34,90$$

$$\mu = \mu = 0,806$$

E =

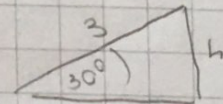
$$\begin{aligned} K_n + U_g &= K_B \\ \frac{1}{2} M v^2 + M g h &= K_B \\ \frac{1}{2} \cdot 5 \cdot 8^2 + 5 \cdot 10 \cdot \frac{3}{2} &= K_B \end{aligned}$$

$$95 \text{ J} = K_B$$

$$M g \cdot F_r \cdot d \cdot \cos 30^\circ = 95 \text{ J}$$

$$50 \cdot F_r \cdot 3 \cdot \cos 30^\circ = 95 \text{ J}$$

$$F_r = 34,90$$



$$\sin 30^\circ = \frac{h}{3}$$

$$h = \frac{3}{2}$$

2)

$$P_A = P_B$$

~~Eje~~ V_x

$$\begin{aligned} 2m \cdot V_{1x} &= m_1 \cdot V_{1x} + m_2 \cdot V_{2x} \\ 2 \cdot 8 &= m \cdot 20 \cdot \cos 37^\circ + m \cdot V_{2x} \\ 16 &= 15,92 + V_{2x} \\ 0,03 \text{ m/s} &= V_x \end{aligned}$$

V_y

$$\begin{aligned} 0 &= m_1 \cdot V_{1y} + m_2 \cdot V_{2y} \\ 0 &= 20 \cdot \sin 37^\circ + V_{2y} \\ V_{2y} &= -12,04 \end{aligned}$$

$$\begin{aligned} |V_{11}| &= \sqrt{0,03^2 + 12,04^2} \\ |V_{11}| &= 12,04 \end{aligned}$$

$$\tan \alpha = \frac{12,04}{0,03}$$

$$\alpha = \tan^{-1} 401,3$$

$$\alpha = 89,85^\circ$$

la dirección será $89,85^\circ$ la trayectoria que llevará original/mundo

3)

$$d = 314 \text{ m}$$

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

a)

$$r = 40 \text{ cm}$$

$$314 = 0 + \frac{1}{2} (0 + \omega_F) \cdot 30 \text{ s}$$

$$314 = \frac{30}{2} \omega_F$$

$$314 = 15 \omega_F$$

$$\omega_F = 20.93 \text{ rpm}$$

r.u.

$$\frac{20.93 \text{ rev}}{1 \text{ min}} \cdot \frac{2\pi \text{ rad}}{1 \text{ rev}} \cdot \frac{1 \text{ min}}{60 \text{ s}}$$

$$2.19 \text{ rad/s} \cdot 30$$

$$65.7 \text{ rad/s}$$

b)

$$20.93 = \omega_1 + \alpha \cdot t$$

$$20.93 = 0 + \alpha \cdot 30$$

$$\frac{20.93}{30} = \alpha$$

$$0.7 \text{ rad/s}^2 = \alpha$$

c)

$$20.93 \cdot 10$$

$$\omega = 209.3$$

$$209.3 = 0 + \alpha \cdot t$$

$$6.97 \text{ rad/s}^2 = \alpha$$