Patricio Champ

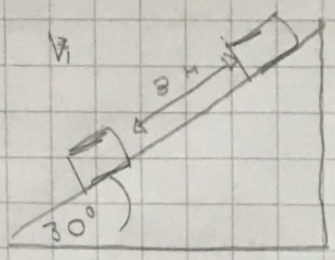
Prueba Nº 4

①

$F_r = \mu \cdot N$

$M = 5\ kg$
$V_i = 8\ m/s$
$d = 3\ mts$
$V_f = 0$
$\alpha = 30°$

$\Sigma F_x = M \cdot a$
$-F_x - F_r = M \cdot a$



$\Sigma F_y = 0$
$F_y = N$

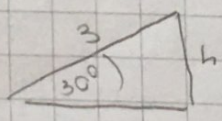
$M \cdot g \cdot \cos\alpha = N$
$5 \cdot 10 \cdot \cos 30° = N$
$43,30 = N$

$F_r = 43,30\ N$

$43,30\ N = 34,90$
$\mu = 0,806$

F_r ... N

$E =$



$E_A + U_g = E_B$
$\frac{1}{2} M v^2 + Mgh = E_B$
$\frac{1}{2} \cdot 5 \cdot 8 + 5 \cdot 10 \cdot \frac{3}{2} = E_B$

$95\ J = E_B$

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

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

$Mg \cdot Fr \cdot d \cdot \cos 30 = 95\ J$
$50 \cdot Fr \cdot 3 \cdot \cos 30 = 95\ J$
$Fr = 34,90$

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(2)

$P_A = P_B$

Vx

$2M \cdot V_{3x} = M_1 \cdot V_{1x} + M_2 \cdot V_{2x}$

$2M \cdot 8 = M \cdot 20 \cdot \cos 37 \cdot M \cdot V_{2x}$

$16 = 15,97 + V_{2x}$

$0,03 \text{ m/s} = V_x$

V_y

$0 = M_1 \cdot V_{1y} + M_2 V_{2y}$

$0 = 20 \cdot \sin 37 + V_{2y}$

$V_{2y} = -12,04$

$|V| = \sqrt{0,03^2 + 12,04^2}$

$|V| = 12,04$

$\text{Tg} = \frac{12,04}{0,03}$

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

$\alpha = 89,85$

La dirección sera 89,85° de la trayectoria que llevaba originalmente

3) $d = 314\ m$
$t = 30\ s$

a) $r = 40\ cm$

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

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

$$314 = 15\ \omega_F$$

$$\omega_F = 20.93\ rpm$$

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

$$2.19\ rad/s \cdot 30$$

65.7 vueltas

b)

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

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

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

$$0.7 = \alpha$$

c)

$$20.93 \cdot 10$$

$$v = 209.3$$

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

$$6.97\ \frac{m/s}{s} = \alpha$$

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