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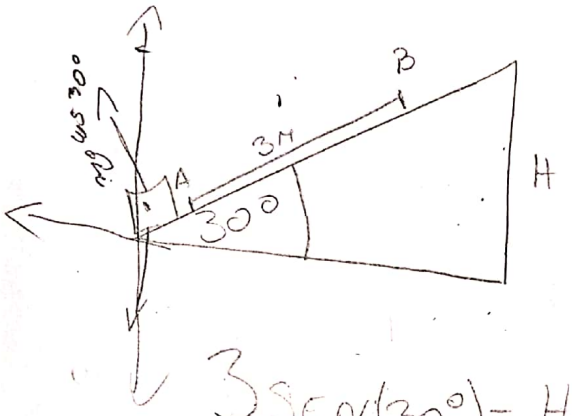
PROBLEMA 1

$m_B = 5\,[Kg]$
$v_i = 8\,[m/s]$ $\quad d = 3[m]$ $\quad \theta = 30°$



$\Delta E = W_{FNC}$

$\therefore E_B - E_A = W_{fR}$

$v_{gB} - K_A = W_{fR}$

$(mg\,h_0) - (\frac{1}{2} m_A \cdot v_A^2) = f_R \cdot d \cdot \cos\theta$

$3\,sen(30°) = H$

$1,5 = H$

$(5 \cdot 10 \cdot 1{,}5) - (\frac{1}{2} \cdot 5 \cdot 8^2) = \mu \cdot mg\cos 30 \cdot d \cdot \cos\theta$

$75 - 160 = (\mu \cdot 50 \cos 30°) \cdot 3 \cdot \cos 180°$

$-85 = \mu \cdot -129{,}9$

$\mu = 0{,}65$

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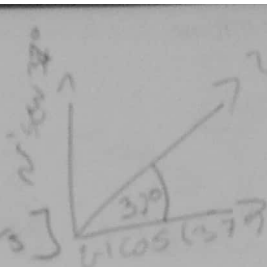
Pregunta 2



$v_1 = 20[m/s]$

$v_{2i} = 8[m/s] \longrightarrow F_2 = ?$
$m_2 = 2M$

Gramos

$M + M = 2M$

$M = \text{Gramos}$

Eje x:

$P_i = P_f$

$(m_2 \cdot v_{2i}) = (m_1 \cdot v_1') + (m_2 \cdot v_2')$

$2M \cdot 8 = M \cdot 20\cos(37) + (M \cdot v_2' \cos\theta) \;/\cdot M$

$16 = 20\cos 37 + v_2' \cos\theta$

$0{,}03 = v_2' \cos\theta$

$\frac{0{,}03}{\cos\theta} = v_{x2}'$

Eje y:

$P_i = P_f$

$0 = (M \cdot 20 \operatorname{sen} 37) + (M \cdot v_2' \operatorname{sen}\theta)$

$-12{,}04M = M v_2' \operatorname{sen}\theta \;/\cdot M$

$\frac{-12{,}04}{\operatorname{sen}\theta} = v_{y2}'$

$\frac{0{,}03}{\cos\theta} = \frac{-12{,}04}{\operatorname{sen}\theta}$

$tg\theta = -401{,}3 \;/\cdot tg^{-1}$

$\theta = -89{,}9°$

Reemplazo:

En x:

$v_{x2}' = \frac{0{,}03}{\cos(-89{,}9)} = 17{,}20$

En y:

$v_{y2}' = \frac{-12{,}04}{\operatorname{sen}(-89{,}9)} = 12{,}04$

$v_2' = \sqrt{(17{,}2)^2 + (12{,}04)^2}$

$v_2' = 20[m/s]$ //

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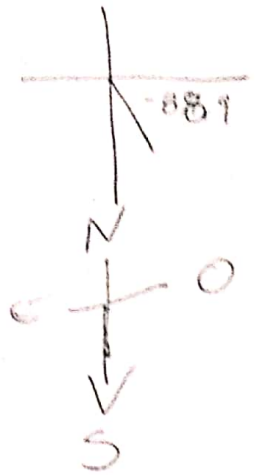
$V' = 20\,[m/s]$



$360 + -89,9 = 270,1°$

R: EL SEGUNDO FRAGMENTO AVANZA A 20[m/s] EN DIRECCIÓN SUR

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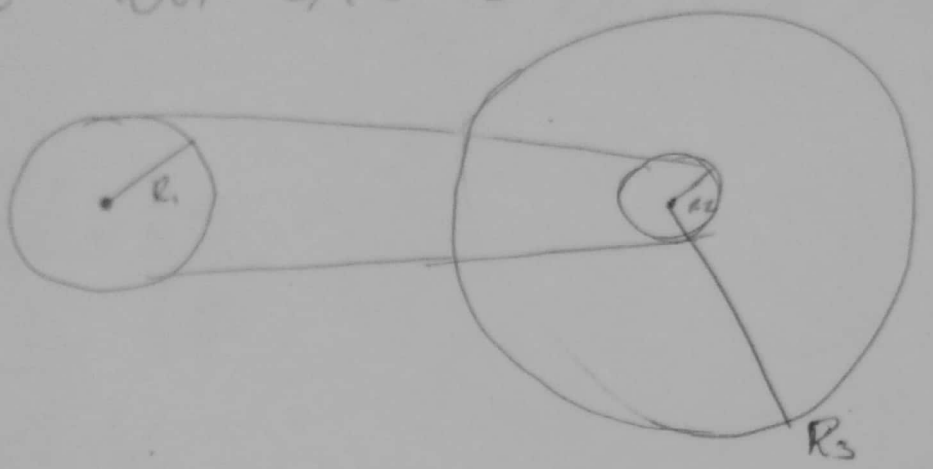
Pregunta 3

314[m] en 30[s]

$R_1 = 10cm = 0,1[m]$
$R_2 = 4cm = 0,04[m]$
$R_3 = 40cm = 0,4[m]$



a) $P_{ERIMETRO} = 2\pi \cdot R$
$= 2\pi \cdot 0,4 = 2,5[m]$

$X_{VUELTAS} = \frac{d_{TOTAL}}{P_{ERIMETRO}}$ $\Big\}$ $X_{VUELTAS} = \frac{314[m]}{2,5}$

$X_{VUELTAS} = 125$

R: DA 125 VUELTAS COMPLETAS.

B) $W_R = ?$

↓

$$V = \frac{d}{t} \quad \left\{ V = \frac{314}{30} = 10{,}47 \left[m/s \right] \right.$$

$$V = W \cdot R$$

$$\frac{10{,}47}{0{,}4} = W \quad \left\{ \begin{array}{l} W = 26{,}175 \\ W = 26{,}2 \left[RAD/s \right] \end{array} \right.$$

c) $\bar{W} = \frac{\Delta\theta}{\Delta t}$

$$V_1 = V_2$$

$$W_1 \cdot R_1 = W_2 \cdot R_2$$

$$W_1 \cdot 0{,}1 = 26{,}2 \cdot 0{,}04$$

$$W_1 = 10{,}48 \left[RAD/s \right]$$

$$\alpha = \frac{10{,}48 - 0}{30 - 0}$$

$$\alpha = 0{,}35 \left[RAD/s^2 \right]$$

$$\therefore \quad \theta_f = \theta_i + W_i t + \frac{1}{2} \alpha \cdot t^2$$

$$\Delta\theta = \frac{1}{2} \cdot 0{,}35 \cdot 30^2$$

$$\Delta\theta = 157{,}5$$

$$\bar{W} = \frac{157{,}5}{30} \quad \left\{ \bar{W} = 5{,}25 \left[RAD/s \right] \right.$$