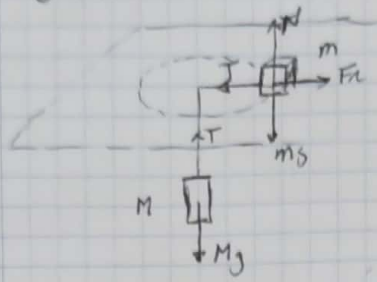
04 DNMK

[m]



$\mu = 0{,}15$

$m = 0{,}2\,kg$

$M = 0{,}35\,kg$

$R = 0{,}3\,m$

CUERPO m

EJE X $T - F_r = F_{cp}$

EJE Y $N - mg = 0$

$T - \mu mg = m\frac{v^2}{R}$

CUERPO M

$Mg - T = 0$

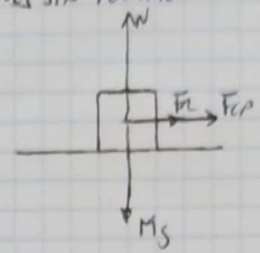
$T = Mg$

$Mg - \mu mg = m\frac{v^2}{R}$

$0{,}35 \cdot 9{,}8 - 0{,}15 \cdot 0{,}2 \cdot 9{,}8 = 0{,}2 \cdot \frac{v^2}{0{,}3}$

$\boxed{V = 2{,}168\,\frac{m}{s}}$

[n] SIN PERALTE — SALE Y GIRA A DCHA.



EJE X

$F_r = F_{cp}$

EJE Y

$N - Mg = 0$

$N = Mg$

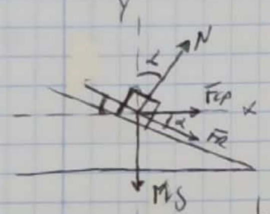
$\mu Mg = M\frac{v^2}{R}$

$V = \sqrt{\mu g R} = \sqrt{0{,}2 \cdot 9{,}8 \cdot 350} =$

$\boxed{V = 26{,}192\,m/s}$

[ñ]

SALE Y GIRA A IZQ

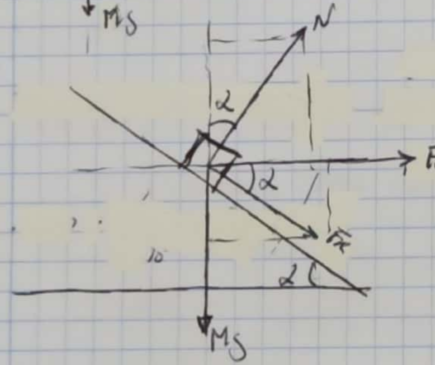


$M = 900\,kg$

$R = 350\,m$

$\mu = 0{,}2 \quad \alpha = 10^\circ$

EJE X



EJE X

$N\sin\alpha + F_r\cos\alpha = F_{cp}$

$N\sin\alpha + \mu N\cos\alpha = F_{cp}$

EJE Y

$N\cos\alpha - F_r\sin\alpha = Mg$

$N\cos\alpha - \mu N\sin\alpha = Mg$

$N = \frac{Mg}{\cos\alpha - \mu\sin\alpha}$

$\frac{Mg\sin 10^\circ}{\cos 10^\circ - \mu\sin 10^\circ} + \frac{\mu Mg\cos 10^\circ}{\cos 10^\circ - \mu\sin 10^\circ} = \frac{Mv^2}{R}$

$\frac{g\sin 10^\circ + \mu g\cos 10^\circ}{\cos 10^\circ - \mu\sin 10^\circ} = \frac{v^2}{R}$

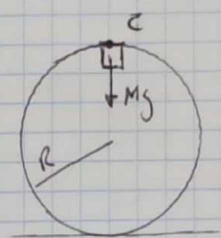
$V = \sqrt{R \cdot g\left(\frac{\sin 10^\circ + \mu\cos 10^\circ}{\cos 10^\circ - \mu\sin 10^\circ}\right)}$

$V = \sqrt{350 \cdot 9{,}8\left(\frac{\sin 10^\circ + 0{,}2 \cdot \cos 10^\circ}{\cos 10^\circ - 0{,}2\sin 10^\circ}\right)}$

$V = \sqrt{350 \cdot 9{,}8\left(\frac{0{,}174 + 0{,}197}{0{,}985 - 0{,}0347}\right)}$

$V = 36{,}578\,m/s$

[o]



$M = 350\,kg$

$R = 7\,m$

$\mu = \emptyset$

V?

EN C SE CUMPLE

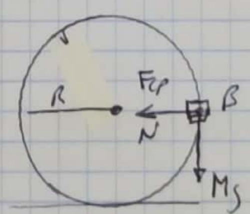
$Mg = F_{cp}$

$Mg = M\frac{v^2}{R}$

$V = \sqrt{Rg} = \sqrt{7 \cdot 9{,}8} = 8{,}283\,m/s$

---

[p]



LA REACCIÓN DEL SUELO ES LA N

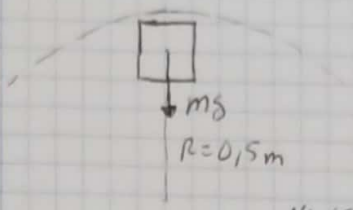
LA QUE ES IGUAL A LA Fcp

$N = F_{cp}$

$F_{cp} = \frac{Mv^2}{R}$

$N = \frac{mv^2}{R} = \frac{350 \cdot 10^2}{7} = 5000\,N$

e)



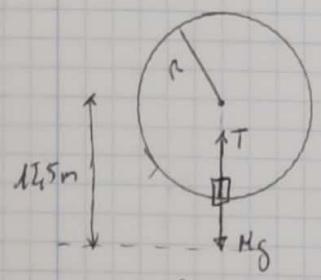
NO SE DESLIZA CUANDO

$mg = F_{cp}$

$mg = m\omega^2 R = m\frac{v^2}{R}$

$\omega = \sqrt{\frac{g}{R}} = \sqrt{\frac{9,8}{0,5}} = 4,427 \text{ rad/s}$

f)



m=1,5kg

R=2,5m

CUANDO T=112N LA CUERDA SE ROMPE

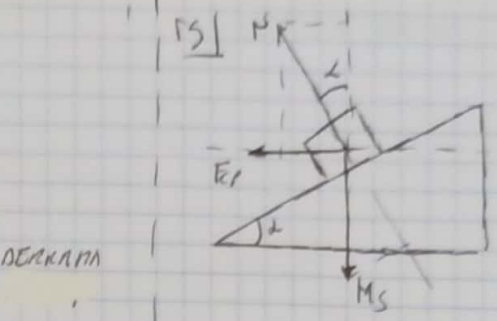
SE CUMPLE QUE $T - M_g = F_{cp}$

$T - M_g = \frac{mv^2}{R}$

$112 - 1,5 \cdot 9,8 = \frac{1,5\,v^2}{2,5}$

$v = 12,734 \text{ m/s}$

g)



$\alpha = 20°$

R=200m

$\mu = \phi$

EJE X

$N\sin\alpha = \frac{mv^2}{R}$

EJE Y

$N\cos\alpha = M_g$

$N = \frac{M_g}{\cos\alpha}$

$M_g \frac{\sin\alpha}{\cos\alpha} = \frac{mv^2}{R}$

$g\,tg\alpha = \frac{v^2}{R} \Rightarrow v = \sqrt{Rg\,tg\alpha}$

$v = \sqrt{200 \cdot 9,8 \cdot tg\,20°}$

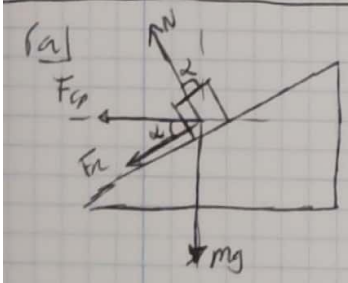
$v = 26,709 \text{ m/s}$

h) MISMO ESQUEMA Y ECUACIONES QUE ANTES

$g\,tg\alpha = \frac{v^2}{R}$ $tg\alpha = \frac{v^2}{Rg}$

$\alpha = \text{arctg}\frac{v^2}{Rg}$ $\alpha = 55,52°$

a)



$\alpha = 15°$

$\mu = 0,1$ SALE Y GIRA A DERECHA

R=300m

EJE X

$N\sin\alpha + F_r\cos\alpha = F_{cp}$

EJE Y

$N\cos\alpha - F_r\sin\alpha = mg$

OPERANDO COMO EN EL 1º

$v = \sqrt{Rg\left(\frac{\sin 15° + 0,1\cos 15°}{\cos 15° - 0,1\sin 15°}\right)}$

$v = \sqrt{300 \cdot 9,8\left(\frac{\sin 15° + 0,1\cos 15°}{\cos 15° - 0,1\sin 15°}\right)}$

$v = \sqrt{2940\left(\frac{0,3554}{0,94}\right)}$

$v = 32,369 \text{ m/s}$