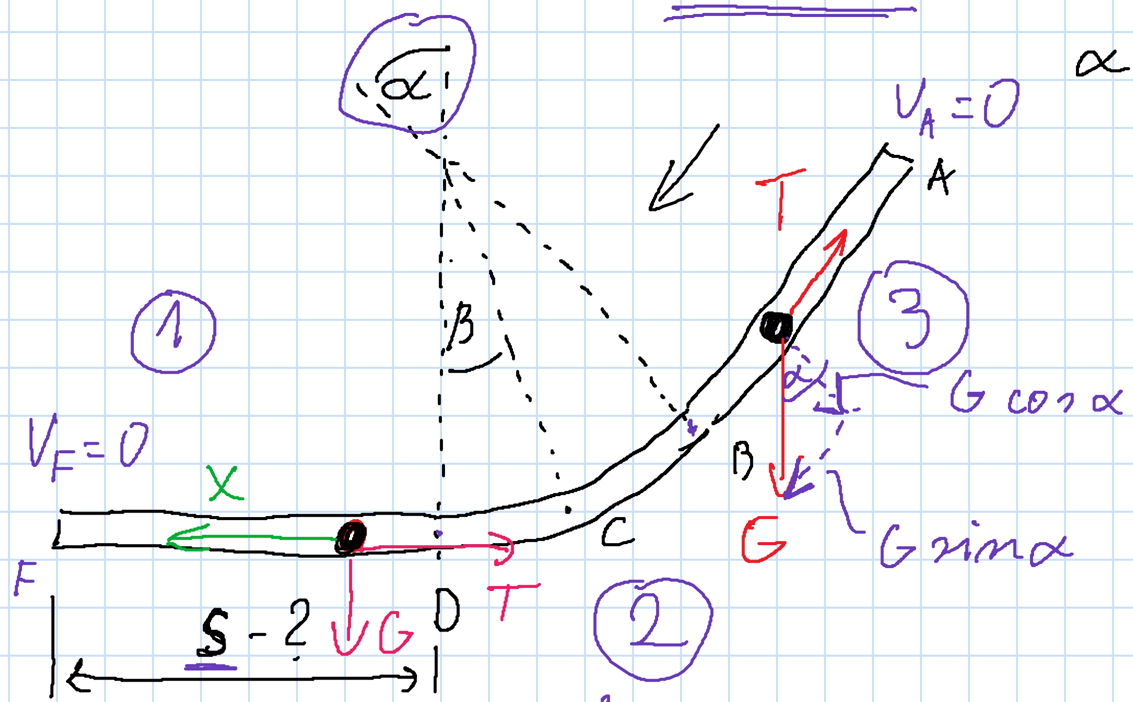
D-ane:

$m = 0{,}6\,kg$, $V_A = 0$, $\underline{\underline{T_{AB} = 2{,}0\,s}}$, $R = 3\,m$, $f = 0{,}2$

$\alpha = 60^\circ$, $\beta = 30^\circ$

Szukane

S, N_C



$$\frac{m V_2^2}{2} \quad \frac{m V_1^2}{2}$$

(1) $$E_{K2} - E_{K1} = L = \int_S \Sigma F_i \, dx$$

$$E_A = E_B$$

(2) $$E_{KA} + E_{PA} = E_{KB} + E_{PB}$$

(3) $$p_2 - p_1 = \int_T \Sigma F_i \, dt$$

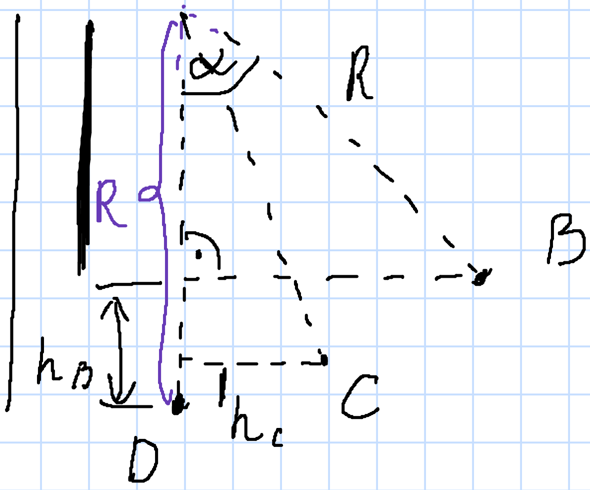
$$m V_2 - m V_1$$

$$m V_B - \underbrace{m V_A}_{0} = \int_{T_{AB}} (+G\sin\alpha - f G\cos\alpha)\, dt$$

$$m V_B = (G\sin\alpha - f G\cos\alpha)\, t \Big|_0^{T_{AB}}$$

$$V_B = (g\sin\alpha - f g\cos\alpha)\, T_{AB}$$

$$V_B = 10(\sin\alpha - 0{,}2\cos\alpha)\cdot 2 = 20(0{,}7..) = 15{,}32\,\tfrac{m}{s}$$



$$\frac{mV_D^2}{2} + \underbrace{E_{pD}}_{0} = \frac{mV_B^2}{2} + \underbrace{E_{pB}}_{mgh_B}$$

$$h_B = R - R\cos\alpha$$

$$\frac{\cancel{m}V_D^2}{2} = \frac{\cancel{m}V_B^2}{2} + \cancel{m}g(R - R\cos\alpha)$$

$$V_D = \sqrt{V_B^2 + 2g(R - R\cos\alpha)}$$

$$V_D = \sqrt{15{,}32^2 + 20(3 - 1{,}5)} = \sqrt{15{,}32^2 + 30}$$

$$V_D \approx 16{,}3\ \frac{m}{s}$$

$$\frac{mV_c^2}{2} + \underbrace{E_{pc}}_{mgh_c} = \frac{mV_D^2}{2} + E_{pD} = 0$$

$$h_c = R - R\cos\beta$$

$$\frac{\cancel{m}V_c^2}{2} + \cancel{m}g(R - R\cos\beta) = \frac{\cancel{m}V_D^2}{2}$$

$$V_c = \sqrt{V_D^2 - 2g(R - R\cos\beta)}$$

$$V_c = \ldots$$

$$E_{kF} - E_{kD} = \int_S (-fG)\,dx$$

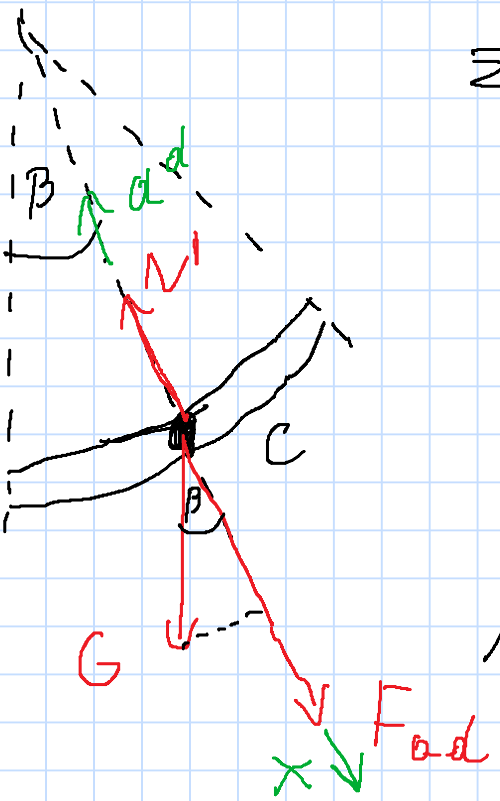
$E_{kF} = 0$ b/c $V_F = 0$

$$-\frac{m V_D^2}{2} = -fG \cdot S$$

$$S = \frac{\cancel{m} V_D^2}{2 f \cancel{m} g}$$

$$S = \frac{V_D^2}{2 f g}$$

$$S = \frac{16{,}3^2}{20 \cdot 0{,}2} = \frac{16{,}3^2}{4} = 66\ m$$



$$\Sigma F_{ix} = 0$$

$$\underbrace{F_{od}}_{= \frac{m V_c^2}{R}} - N' + G \cos\beta = 0$$

$$\frac{m V_c^2}{R} = m\, a^d$$

$a^d = \omega^2 \cdot R$

$\omega = \frac{V}{R}$

$$N' = G \cos\beta + \frac{m V_c^2}{R}$$

$N' = \ldots\ [N]$