

Fabian Pera

Problema 1

$$m = 5 \text{ [Kg]}$$

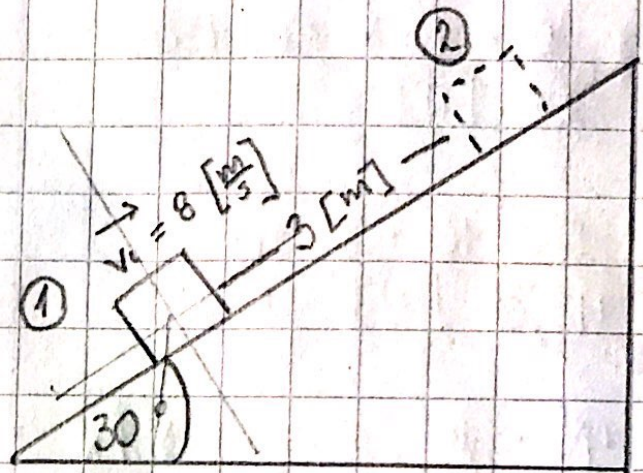
$$V_0 = 8 \text{ [m/s]}$$

$$V_f = 0 \text{ m/s}$$

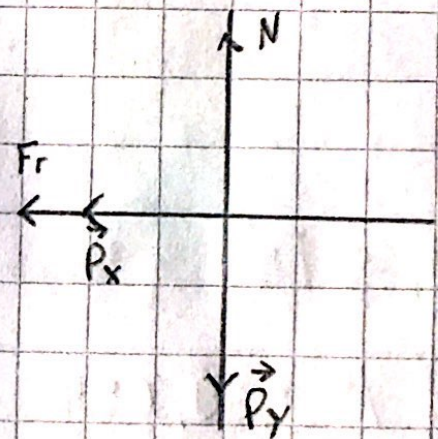
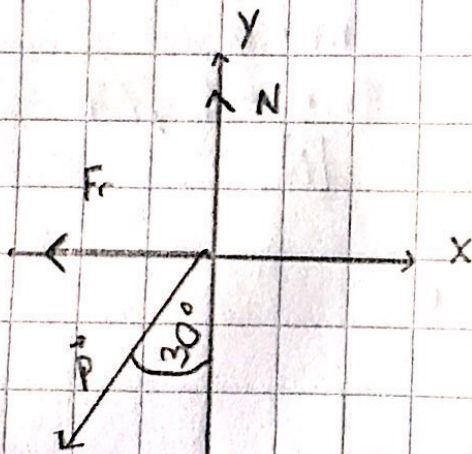
$$d = 3 \text{ [m]}$$

$$\alpha = 30^\circ$$

$$\mu = ?$$



ddl :



$$P_x = m \cdot g \cdot \sin(30)$$

$$P_y = m \cdot g \cdot \cos(30)$$

$$F_r = N \cdot \mu$$

$$N = m \cdot g \cdot \cos(30)$$

$$\Sigma F_y = 0$$

$$N = P_y$$

$$V_f^2 = V_0^2 + 2a \cdot \Delta X$$

$$0 = 64 + 2 \cdot a \cdot 3$$

$$a = -10,67 \text{ [m/s}^2\text{]}$$

~~40~~

Fabión Peña

$$P_x = 5 \cdot 10 \cdot \sin(30)$$

$$P_x = 25 \text{ [N]}$$

$$P_y = 5 \cdot 10 \cdot \cos(30)$$

$$P_y = 43,3 \text{ [N]} = N$$

$$F_r = N \cdot \mu$$

$$\Sigma F_x = m \cdot a$$

$$-P_x - F_r = m \cdot a$$

$$-25 - F_r = 5 \cdot -10,67$$

$$F_r = 28,35 \text{ [N]}$$

$$28,35 \text{ [N]} = 43,3 \text{ [N]} \cdot \mu$$

$$\mu = 0,654 \approx 0,65 //$$



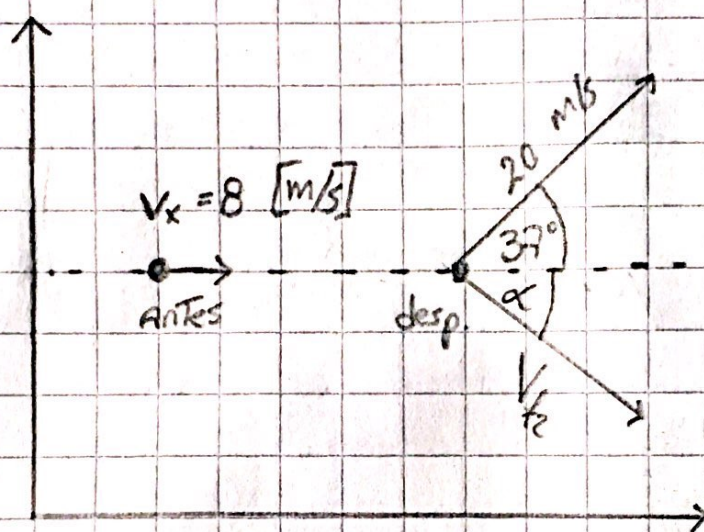
Problema 2

Robón Peña

$$V_{x0} = 8 \text{ [m/s]}$$

$$f_1: V = 20 \text{ [m/s]} / 37^\circ$$

~~Robón Peña~~



$$(20 \cdot \cos(37^\circ))^2 + (20 \cdot \sin(37^\circ))^2 \text{ [m/s]}$$

$$\vec{P}_{Ax} = \vec{P}_{Dx}$$

$$V_{0x} \cdot m \cdot 2 = V_{f1} \cdot \cos(37^\circ) \cdot m + V_{f2} \cdot \cos(\alpha) \cdot m$$

$$8 \cdot 2 = 20 \cdot \cos(37^\circ) + V_{f2} \cdot \cos(\alpha)$$

$$V_{f2} \cdot \cos(\alpha) = 0,027 \rightarrow V_{f2} = \frac{0,027}{\cos(\alpha)}$$

$$\vec{P}_{Ay} = \vec{P}_{Dy}$$

$$V_{0y} \cdot m \cdot 2 = (V_{f1} \cdot \sin(37^\circ) - V_{f2} \cdot \sin(\alpha)) \cdot m$$

$$0 = 20 \cdot \sin(37^\circ) - V_{f2} \cdot \sin(\alpha)$$

$$12,036 = V_{f2} \cdot \sin(\alpha)$$

$$V_{f2} = \frac{12,036}{\sin(\alpha)}$$

fabrián Peña 2C

$$V_{f2} = \frac{0,023}{\cos(\alpha)}$$

$$\frac{12,036}{0,023} = \frac{\sin(\alpha)}{\cos(\alpha)}$$

$$445,98 = \tan(\alpha) \quad / -1$$

$$\alpha = 89,87^\circ$$

$$\|V_{f2}\| = \sqrt{(12,036)^2 + (0,023)^2}$$

$$\|V_{f2}\| = 12,03 \text{ (m/s)}$$



Problema 3

Fabian Peña 2C

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

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

$$R_1 = 10 \text{ [cm]} \rightarrow 0,1 \text{ [m]}$$

$$R_2 = 4 \text{ [cm]} \rightarrow 0,04 \text{ [m]}$$

$$R_3 = 40 \text{ [cm]} \rightarrow 0,4 \text{ [m]}$$

$$\text{perímetro rueda} = 2\pi \cdot 0,4 = 0,8\pi \text{ [m]}$$

$$\frac{d}{\text{perímetro}} = \frac{314}{0,8\pi} = 124,93 \text{ vueltas} //$$

$$\frac{124,93}{30} \frac{\text{vueltas}}{[\text{s}]} = 4,16 \frac{\text{rev}}{\text{s}} \cdot \frac{60 \text{ s}}{1 \text{ min}} = 249,9 \text{ [rpm]}$$

$$249,9 \cdot \frac{2\pi}{60} = 26,16 \left[\frac{\text{rad}}{\text{s}} \right] //$$

$$R_2 \cdot \omega_3 = V_{e_2}$$

$$0,04 \cdot 26,16 = 1,046 \text{ m/s}$$

$$V_{e_2} = V_{e_1}$$

$$1,046 = \omega_1 \cdot R_1$$

$$1,046 = \omega_1 \cdot 0,1$$

$$\omega_1 = 10,464 \left[\frac{\text{rad}}{\text{s}} \right] //$$

a) 125 vueltas

b) $26,2 \left[\frac{\text{rad}}{\text{s}} \right]$

c) $10,46 \left[\frac{\text{rad}}{\text{s}} \right]$

