

$$1. \quad 5 \text{ [kg]} \quad v_i = 8 \text{ [m/s]} \quad d = 3 \text{ [m]} \quad \theta = 30^\circ$$

$$F_r = \mu \cdot N$$

$$N = W_y$$

$$W_y = m \cdot g \cdot \cos(30^\circ)$$

$$W_y = 5 \text{ [kg]} \cdot 10 \left[ \frac{\text{m}}{\text{s}^2} \right] \cdot 0,87$$

$$W_y = 43,5 \text{ [N]}$$

$$N = 43,5 \text{ [N]}$$

$$F_r = 43,5 \mu$$

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

$$W_x = m \cdot g \cdot \sin(30^\circ)$$

$$W_x = 5 \text{ [kg]} \cdot 10 \left[ \frac{\text{m}}{\text{s}^2} \right] \cdot 0,5$$

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

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

$$-25 \text{ [N]} - 43,5 \mu = 5 \cdot a$$

$$2ax = (v_0)^2$$

$$a = \frac{(v_0)^2}{2x} \quad a = \frac{\left[ 8 \frac{\text{m}}{\text{s}} \right]^2}{2 \cdot 3 \text{ [m]}} = \frac{64 \frac{\text{m}^2}{\text{s}^2}}{6 \text{ m}} = 10,67 \left[ \frac{\text{m}}{\text{s}^2} \right]$$

$$a = 10,67 \left[ \frac{\text{m}}{\text{s}^2} \right]$$

$$-25 \text{ [N]} - 43,5 \mu = 5 \cdot -10,67 \left[ \frac{\text{m}}{\text{s}^2} \right] \quad / \cdot -1$$

$$25 \text{ [N]} + 43,5 \mu = + 53,35 \left[ \frac{\text{m}}{\text{s}^2} \right]$$

$$43,5 \mu = + 53,35 \left[ \frac{\text{m}}{\text{s}^2} \right] - 25 \text{ [N]}$$

$$43,5 \mu = 28,35$$

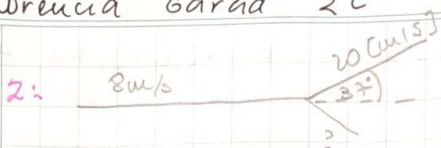
$$\mu = 0,65$$

$$F_r = \mu \cdot N$$

$$F_r = 0,65 \cdot 43,5$$

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

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Eje X

$$2 \text{ m} \cdot V_{Bx} = m_1 \cdot V_{1x} + m_2 \cdot V_{2x}$$

$$2 \text{ m} \cdot 8 \text{ (m/s)} = 2 \text{ m} \cdot 20 (\cos 37^\circ) + V_{2x} \text{ m}$$

$$16 \text{ (m/s)} = 15,97 + V_{2x}$$

$$0,03 \text{ (m/s)} = V_{2x}$$

Eje Y

$$0 = m_1 \cdot V_{1y} + m_2 \cdot V_{2y}$$

$$0 = 20 \cdot \sin(37^\circ) + V_{2y}$$

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

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

$$|V| = 12,4 \text{ (m/s)}$$

$$\theta = \tan^{-1} \left( \frac{12,4}{0,03} \right)$$

$$\theta = 89,85^\circ$$

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$$3 = 314 \text{ [m]} \quad 30 \text{ [s]}$$

$$R_1 = 10 \text{ [cm]}, R_2 = 4 \text{ [cm]}$$

$$R_3 = 40 \text{ [cm]}$$

$$a) R_3 = 40 \text{ [cm]} \rightarrow 0,4 \text{ [m]} \quad s = \theta \cdot R$$

$$v = \frac{d}{t}$$

$$v = \frac{314}{30} = 10,47 \left[ \frac{\text{m}}{\text{s}} \right]$$

$$v = \omega \cdot R$$

$$10,47 \left[ \frac{\text{m}}{\text{s}} \right] = \omega \cdot 0,4 \text{ [m]}$$

$$26,18 \text{ [rad/s]} = \omega$$

$$26,18 = \frac{\theta}{30 \text{ [s]}}$$

$$\theta = 785,4 \text{ rad}$$

$$\frac{785,4 \text{ rad}}{2\pi \text{ rad}} = \frac{1 \text{ vuelta}}{2\pi \text{ rad}} = 125 \text{ vueltas}$$

$$b) \bar{\omega} = \frac{\Delta \theta}{\Delta t}$$

$$\bar{\omega} = \frac{785,4 \text{ rad} - 0}{30 \text{ s} - 0} = 26,17 \left[ \frac{\text{Rad}}{\text{s}} \right]$$

$$c) \omega_1 \cdot r_1 = \omega_2 \cdot r_2$$

$$26,17 \left[ \frac{\text{rad}}{\text{s}} \right] \cdot 0,4 \text{ m} = \omega_2 \cdot 0,1 \text{ m}$$

$$\omega_2 = 104,68 \left[ \frac{\text{rad}}{\text{s}} \right] \text{ as.}$$

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