

Problema 2E

$$F_r = m \cdot g \cos 30$$

$$m \cdot g \cos 30$$

El ángulo 30

1-

$$m = 5 \text{ kg}$$

$$v_i = 8 \text{ m/s}$$

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

$$\theta = 30^\circ$$

$$\Delta E = FNC$$

$$K_i - U_g = FNC$$

$$K - U_g + U_c = FNC$$

$$75 - 160 = F \cdot d \cos 180$$

$$-85 = m \cdot g \cos 30 \cdot 3 \cdot -1$$

$$-85 = 14.129.9$$

$$-129.9$$

$$0.65 = \mu$$

$$F = k \cdot x$$

$$U_g = mgh$$

$$U_g = 5 \cdot 10 \cdot 3 \sin 30$$

$$U_g = 75$$

$$K = \frac{1}{2} m v^2$$

$$K = \frac{1}{2} \cdot 5 \cdot 8^2$$

$$K = 160$$

Tolerancia 25

Problema 2

En X

$$2m \cdot 8m/s = m \cdot 20m/s \cos 37^\circ + m \cdot V_x \cos \theta$$

$$16 = 15.97 + V \cos 89.86^\circ$$

$$12.29 = V_x$$

En y

$$0 = m \cdot 20m/s \sin 37^\circ + m \cdot V \sin \theta$$

$$V = \frac{-20m/s \sin 37^\circ}{\sin \theta}$$

$$V = -12.03$$

$$2 \cdot 16 = 20m/s \cos 37^\circ + \left(\frac{-20m/s \sin 37^\circ}{\sin \theta} \cdot \cos \theta \right)$$

$$16 = 20m/s \cos 37^\circ - \frac{20 \sin 37^\circ}{\tan \theta}$$

$$\frac{20 \sin 37^\circ}{\tan \theta} = 20m/s \cos 37^\circ - 16$$

$$\frac{12.0363}{\tan \theta} = 15.9727 - 16$$

$$\frac{12.0363}{-0.0273} = \tan \theta$$

$$-89.86^\circ = \theta$$

$$V = \frac{-20m/s \sin 37^\circ}{\sin -89.86^\circ}$$

$$V = +12.03 [m/s]$$

$$\text{Magnitud} = \sqrt{12.29^2 + 12.03^2}$$

$$\text{Magnitud} = 17.19$$

Henry

Voluntario 2E

Problema 3

a)

$$\text{Perimetro} = 2 \cdot \pi \cdot 0,4$$

$$P = 2,513 \text{ (m)}$$

$$N_{\text{vueltas}} = \frac{d}{P} = \frac{314 \text{ m}}{2,513 \text{ m}} = 124,98 \approx \boxed{125 \text{ vueltas}}$$

b)

$$\omega = \frac{2\pi}{T} = 2\pi \left(\frac{125}{30} \right) = \boxed{26,2 \text{ rad/s}}$$

c)

$$\omega_2 = \omega_1$$

$$R_1 \omega_1 = R_2 \omega_2$$

$$\omega = \frac{1}{R_1} \cdot \frac{1}{R_2}$$

$$\omega = \frac{0,04 \cdot 26,2}{0,1} = \boxed{10,48 \text{ rad/s}}$$

Bruno