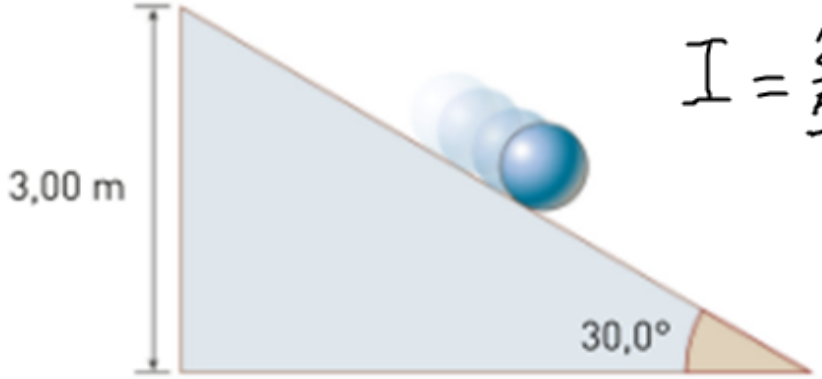
PAG. 525 N6

$m = 2{,}50\ kg$

$r = 0{,}50\ m$

$v_F = ?$



$$I = \frac{2}{5} m r^2$$

$$E_{INIZ.} = E_{FIN.}$$

$$mgh = \frac{1}{2} m v_F^2 + \frac{1}{2} I \omega^2$$

$$\omega = \frac{v}{r}$$

$$mgh = \frac{1}{2} m v_F^2 + \frac{1}{2} \cdot \frac{2}{5} m r^2 \frac{v_F^2}{r^2}$$

$$gh = \frac{1}{2} v_F^2 + \frac{1}{5} v_F^2$$

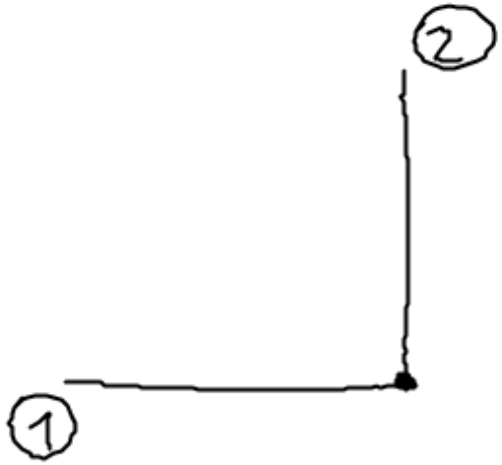
$$10gh = 7 v_F^2 \Rightarrow v_F = \sqrt{\frac{10gh}{7}} =$$

$$= 6{,}5\ \frac{m}{s}$$

N. 1 pag. 524

$M_1 = 800\ kg$ $\quad M_2 = 900\ kg$

$v_1 = 54\ km/h$ $\quad v_2 = 72\ km/h$



$$\vec{p}_{TOT} = \vec{p}_1 + \vec{p}_2$$

$$p_{TOT} = \sqrt{p_1^2 + p_2^2} =$$

$$= \sqrt{\left(800 \cdot \frac{54}{3,6}\right)^2 + \left(900 \cdot \frac{72}{3,6}\right)^2}\ kg \cdot \frac{m}{s} \simeq$$

$$= 21633 \ldots\ kg \cdot \frac{m}{s} \simeq 2,2 \times 10^4\ kg \cdot \frac{m}{s}$$

$$\vec{p}_{TOT.\ INIZ.} = \vec{p}_{TOT.\ FIN.}$$

$$(M_1 + M_2)\,\vec{V}_{FIN.}$$

PASSO AI MODULI

$$p_{TOT.\ INIZ.} = (M_1 + M_2)\,V_{FIN.}$$

$$V_{FIN.} = \frac{p_{TOT.\ INIZ.}}{M_1 + M_2} = \frac{21\,633\ldots\ \text{kg}\cdot\frac{\text{m}}{\text{s}}}{1700\ \text{kg}} \simeq 13\ \frac{\text{m}}{\text{s}}$$

N. 109

1) SFERA CAVA $I_1 = \frac{2}{3} m R^2$

2) SFERA PIENA $I_2 = \frac{2}{5} m R^2$

3) GUSCIO CILINDRICO $I_3 = m R^2$

4) CILINDRO PIENO $I_4 = \frac{1}{2} m R^2$

$$\frac{2}{5} < \frac{1}{2} < \frac{2}{3} < 1$$

$$E_c = \frac{1}{2} m v^2 + \frac{1}{2} I \omega^2 \qquad U$$

$$\frac{1}{2} m v^2 + \frac{1}{2} I \omega^2 = m g h$$

$$h = \frac{1}{2} \frac{v^2}{g} + \frac{1}{2} \frac{\omega^2}{mg} I$$