

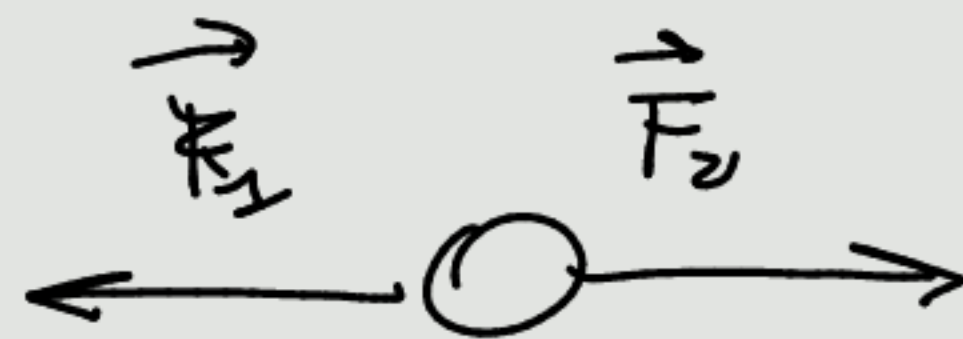
m. 1

$$m_1 = 375 \text{ kg}$$

$$m_2 = 12 \text{ kg}$$

$$a_1 = ?$$

$$a_2 = 50 \frac{\text{m}}{\text{s}^2}$$



(A)

$$F_1 = F_2$$

$$m_1 a_1 = m_2 a_2$$

$$a_1 = \frac{m_2}{m_1} a_2 = \frac{12 \text{ kg}}{375 \text{ kg}} \cdot 50 \frac{\text{m}}{\text{s}^2} = 1,6 \frac{\text{m}}{\text{s}^2}$$

(B)

$$F_{\text{Tot}} = F_1 + F_2 = m_1 a_1 + m_2 a_2 = \underbrace{375 \text{ kg} \cdot 1,6 \frac{\text{m}}{\text{s}^2}}_{600 \text{ N}} + \underbrace{12 \text{ kg} \cdot 50 \frac{\text{m}}{\text{s}^2}}_{600 \text{ N}} = 1200 \text{ N}$$

M2 / BILANCA IN ASCENSORE

$$m = 90 \text{ kg}$$

(A) FERMO

$$P = mg = 90 \text{ kg} \cdot 9,8 \frac{\text{m}}{\text{s}^2} = 882 \text{ N}$$

(B) ACCELERA ↓
 $a = 0,8 \frac{\text{m}}{\text{s}^2}$

$$P = m(g - a) = 90 \text{ kg} (9,8 - 0,8) \frac{\text{m}}{\text{s}^2} = 810 \text{ N}$$

(C) V costante (M.R.U.)
 $a = 0$

$$P = mg = 882 \text{ N}$$

(D) FRENA

$$a = 1,2 \frac{\text{m}}{\text{s}^2}$$

$$P = m(g + a) = 90 \text{ kg} (9,8 + 1,2) \frac{\text{m}}{\text{s}^2} = 990 \text{ N}$$

m-3 / GIRADISCHI

$$m = 8 \text{ gr} = 0,008 \text{ kg}$$

$$r = 5,9 \text{ cm} = 0,059 \text{ m}$$

$$\mu = 0,95$$

m MAX giri al secondo

(A)

$$F_{\text{CENTR}} = F_{\text{ATT}}$$

$$m \cdot a_c = \mu \cdot F_{\perp}$$

$$\cancel{m} \cdot \frac{v^2}{r} = \mu \cdot \cancel{m} g$$

$$\frac{(\omega r)^2}{r} = \mu g$$

$$\omega^2 r = \mu g$$

$$\omega = \sqrt{\frac{\mu \cdot g}{r}} = \sqrt{\frac{0,95 \cdot 9,8 \frac{\text{m}}{\text{s}^2}}{0,059 \text{ m}}} = 12,6 \frac{\text{RAD}}{\text{S}}$$

$$\omega = 2\pi f \Rightarrow$$

$$f = \frac{\omega}{2\pi} = \frac{12,6 \frac{\text{RAD}}{\text{S}}}{2\pi} = 2 \text{ HZ}$$

(B)

$$F_c = m a_c = m \frac{v^2}{r} = \frac{m (\omega r)^2}{r} = \frac{m \omega^2 r^2}{r} = m \omega^2 r = 0,008 \text{ kg} \left(12,6 \frac{\text{RAD}}{\text{S}} \right)^2 \cdot 0,059 \text{ m} = 0,0715 \text{ N}$$



4 / PENDOLO

$$l = 1,2 \text{ m}$$

$$g = ?$$

100 oscillazioni in 280 s

$$T = \frac{280 \text{ s}}{100} = 2,8 \text{ s}$$

$$(A) \quad T = 2\pi \sqrt{\frac{l}{g}}$$

$$T^2 = 4\pi^2 \frac{l}{g}$$

$$g = \frac{4\pi^2 l}{T^2} = \frac{4\pi^2 \cdot 1,2 \text{ m}}{(2,8 \text{ s})^2} = 6,04 \frac{\text{m}}{\text{s}^2}$$

$$(B) \quad P_{\text{TERM}} = 800 \text{ N} = P_{\text{tension}} = m g_T \quad m = \frac{P_T}{g_T} = \frac{800 \text{ N}}{9,8 \frac{\text{m}}{\text{s}^2}} = 81,5 \text{ kg}$$

$$P_{\text{P.S.}} = m g = 81,5 \text{ kg} \cdot 6,04 \frac{\text{m}}{\text{s}^2} = 492,26 \text{ N}$$