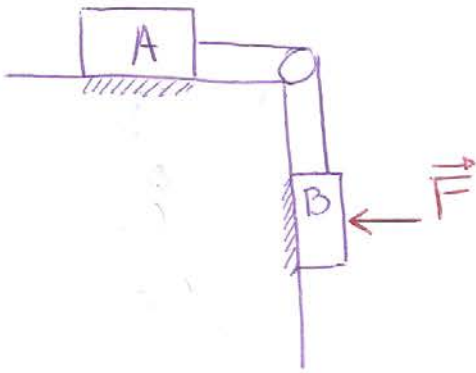


Guía Dinámica - Ejercicio 10



Datos

$$\mu_e = 0,5$$

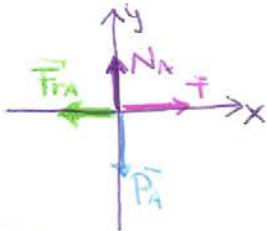
$$\mu_d = 0,2$$

$$|\vec{F}| = 100(N)$$

$$m_A = 10 \text{ kg}$$

El sistema se encuentra bajo condición de mov. inminente
 $\Rightarrow \vec{F}_r = \vec{F}_{r \max}$

2) La única opción ~~posible~~ es que el cuerpo B tienda a deslizarse hacia abajo.



(A)

$$\bullet \sum F_y = 0$$

$$N_A - P_A = 0$$

$$\boxed{N_A = P_A = 98(N)}$$

$$\bullet \sum F_x = 0$$

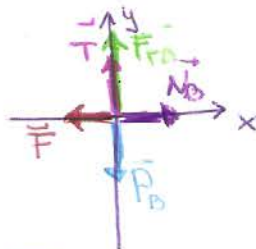
$$-F_{rA} + T = 0$$

$$-\mu_e N_A + T = 0$$

$$T = \mu_e N_A$$

$$T = 0,5 \cdot 98(N)$$

$$\boxed{T = 49(N)}$$



(B)

$$\bullet \sum F_x = 0$$

$$-F + N_B = 0$$

$$\boxed{N_B = F = 100(N)}$$

\Downarrow

$$\vec{F}_{rB} = \mu_e N_B = 0,5 \times 100(N) = \boxed{50(N) = F_{rB}}$$

est. max.



$$\bullet \sum F_y = 0$$

$$T + F_{rB} - P_B = 0$$

$$49(N) + 50(N) - P_B = 0$$

$$99(N) = P_B = m_B g$$

$$m_B = \frac{99(N)}{9,8 \text{ m/seg}^2} = \boxed{10,10 \text{ kg} = m_B}$$

(1)

$$(b) T = 49 \text{ (N)}$$

$$(c) \text{ Se duplica } m_B = 20,20 \text{ kg.}$$

CUERPO A

$$\bullet \Sigma F_y = 0$$

$$N_A = P_A = 98 \text{ (N)}$$

$$\bullet \Sigma F_x = m_A a$$

$$-F_{rA} + T = m_A a$$

$$-\mu_s \cdot N_A + T = m_A a$$

$$-0,2 \times 98 \text{ (N)} + T = 10 \text{ kg} a$$

$$\boxed{-19,6 \text{ (N)} + T = 10 \text{ kg} a}$$

①

CUERPO B

$$\bullet \Sigma F_x = 0$$

$$-F + N_B = 0$$

$$N_B = F = 100 \text{ (N)}$$

$$\bullet \Sigma F_y = -m_B a \text{ (desciende)}$$

$$T + F_{rB} - P_B = -m_B a$$

$$T + 0,2 \times 100 \text{ (N)} - 20,2 \times 9,8 \text{ (N)} = -20,2 \text{ kg} a$$

$$\boxed{T + 20 \text{ (N)} - 197,96 \text{ (N)} = -20,2 \text{ kg} a}$$

②

Das ecuaciones con dos incógnitas T y a
Hacemos Ec. ① - Ec. ②

$$-19,6 \text{ (N)} + \cancel{T} - \cancel{T} - 20 \text{ (N)} + 197,96 \text{ (N)} = (10 + 20,2) \text{ kg} a$$

$$\frac{158,36 \text{ (N)}}{30,2 \text{ kg}} = a$$

$$\boxed{5,24 \frac{\text{m}}{\text{seg}^2} = a}$$

②

d) De la ecuación (1)

$$T = 10 \text{ kg} \cdot a + 19,6 \text{ (N)}$$

$$T = 52,4 \text{ (N)} + 19,6 \text{ (N)}$$

$$T = 72 \text{ (N)}$$