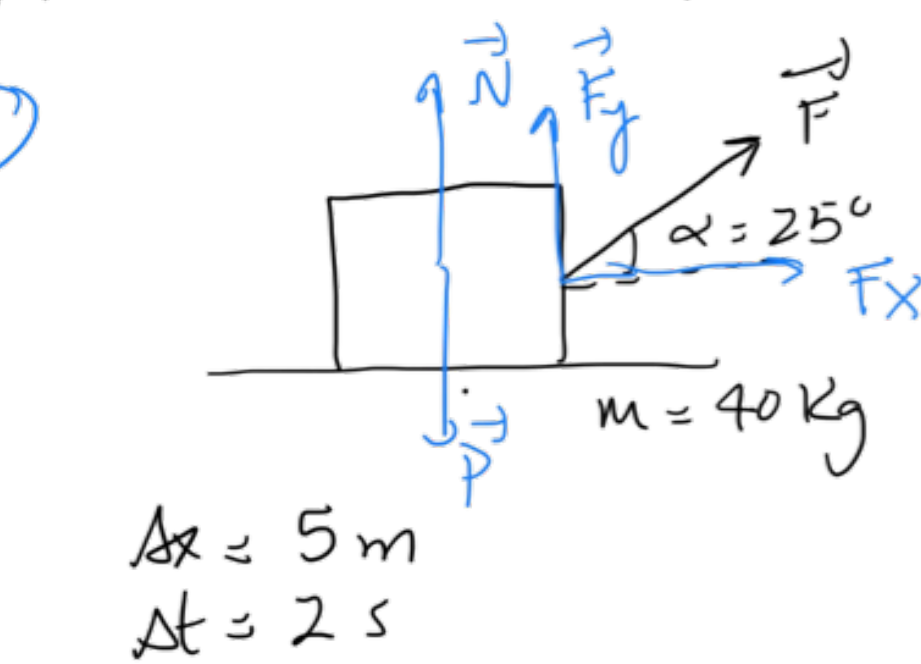


Activitats - Preparació examen unitat 3

1



$$\Delta x = v_0 t + \frac{1}{2} a t^2$$

$$5 = \frac{1}{2} \cdot a (2)^2$$

$$10 = 4a$$

$$[a = 2,5 \text{ m/s}^2]$$

$$\text{eix X } \vec{F}_x = m \cdot a$$

$$\text{eix Y } \vec{P} - \vec{N} - \vec{F}_y = m \cdot a = 0$$

$$\vec{N} = \vec{P} - \vec{F}_y = mg - F \sin \alpha$$

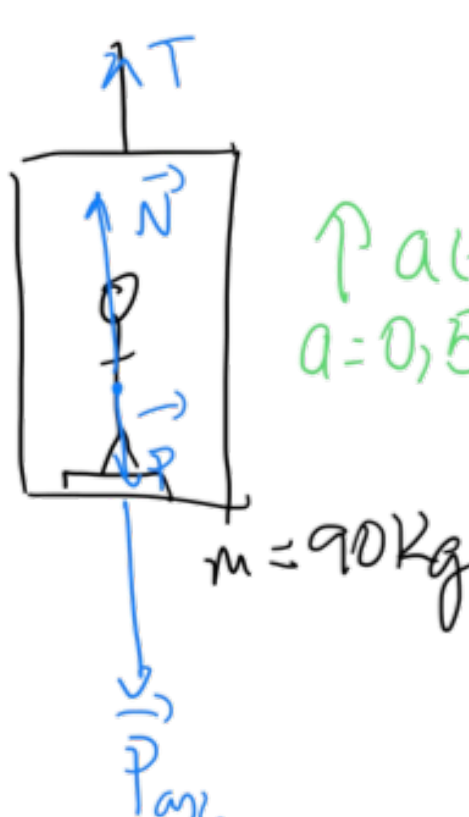
$$F \cos \alpha = m \cdot a$$

$$F = \frac{m \cdot a}{\cos \alpha} = \frac{40 \cdot 2,5}{\cos 25^\circ} = [110,34 \text{ N}]$$

$$\vec{N} = 40 \cdot 9,8 - 110,34 \cdot \sin 25^\circ$$

$$[\vec{N} = 345,37 \text{ N}]$$

2



$$a) \quad N - P = m \cdot a$$

$$N - mg = m \cdot a$$

$$N = ma + mg$$

$$N = m(a + g)$$

$$N = 90(0,5 + 9,8)$$

$$N = 927 \text{ N}$$

$$[N = P_{\text{balance}} = 927 \text{ N}]$$

pel principi d'acció - reacció

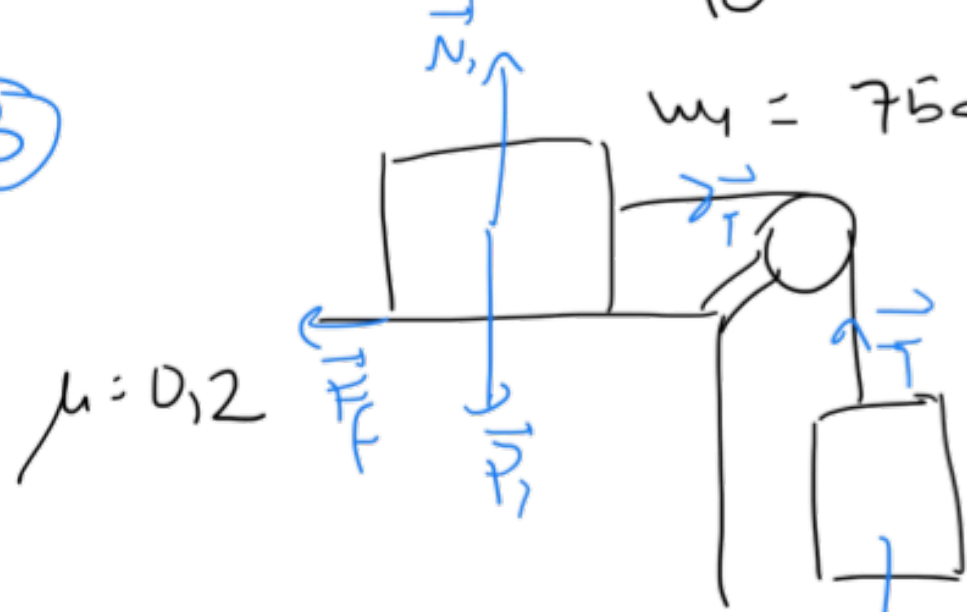
$$b) \quad N - P = m \cdot a \quad N = P_{\text{balance}}$$

$$52,5 - mg = m \cdot a$$

$$52,5 - 90 \cdot 9,8 = 90a$$

$$a = \frac{-829,5}{90} = [-9,21 \text{ m/s}^2]$$

3



$$m_1 = 75 \text{ kg} \cdot \frac{1 \text{ kg}}{10^3 \text{ g}} = 0,075 \text{ kg}$$

$$m_2 = 125 \text{ kg} \cdot \frac{1 \text{ kg}}{10^3 \text{ g}} = 0,125 \text{ kg}$$

$$\omega 1 \quad \text{eix X } T - F_f = m_1 a$$

$$\text{eix Y } P_1 - N_1 = m_1 a = 0$$

$$\omega 2 \quad \text{eix Y } P_2 - T = m_2 a$$

$$T = (T) \text{ movement}$$

$$T - F_f = m_1 a$$

$$P_2 - T = m_2 a$$

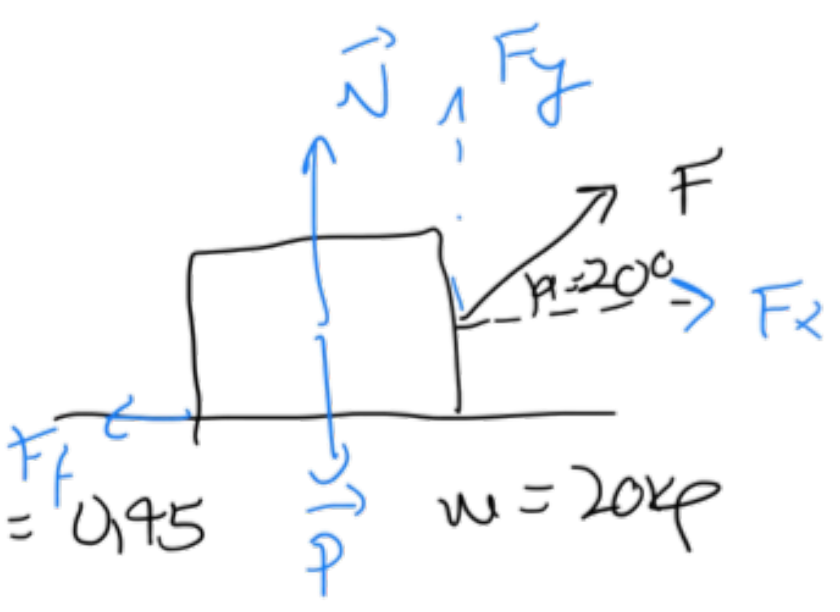
$$P_2 - F_f = a(m_1 + m_2)$$

$$m_2 g - \mu m_1 g = a(m_1 + m_2)$$

$$0,125 \cdot 9,8 - 0,2 \cdot 0,075 \cdot 9,8 = (0,125 + 0,075)a$$

$$a = \frac{1,078}{0,2} = [5,39 \text{ m/s}^2]$$

4



$$m = 20 \text{ kg}$$

$$\mu_e = 0,45$$

$$\mu_d = 0,42$$

$$a) \quad F_{\text{lim}} \Rightarrow a = 0$$

$$\text{eix X } F_x - F_f = m \cdot a$$

$$\text{eix Y } P - N - F_y = m \cdot a = 0$$

$$N = P - F_y = mg - F \sin \alpha$$

$$F_x - F_f = m \cdot a$$

$$F_x = F_f = \mu N$$

$$F \cos \alpha = \mu (mg - F \sin \alpha)$$

$$F \cos \alpha + \mu F \sin \alpha = \mu mg$$

$$F \cos 20^\circ + 0,45 \cdot F \sin 20^\circ = 0,45 \cdot 20 \cdot 9,8$$

$$1,09 F = 88,2$$

$$[F = 80,65 \text{ N}]$$

$$b) \quad \text{mateix cas que l'anterior, però quan } \mu_d = 0,42$$

$$F \cos 20^\circ + 0,42 \cdot F \sin 20^\circ = \mu mg$$

$$1,083 F = 88,2$$

$$[F = 81,41 \text{ N}]$$

c)

$$F_x = F \cos \alpha = 65 \cos 20^\circ = 61,08 \text{ N}$$

$$F_f = \mu N = 0,42 (20 \cdot 9,8 - 65 \sin 20^\circ) = 72,98 \text{ N}$$

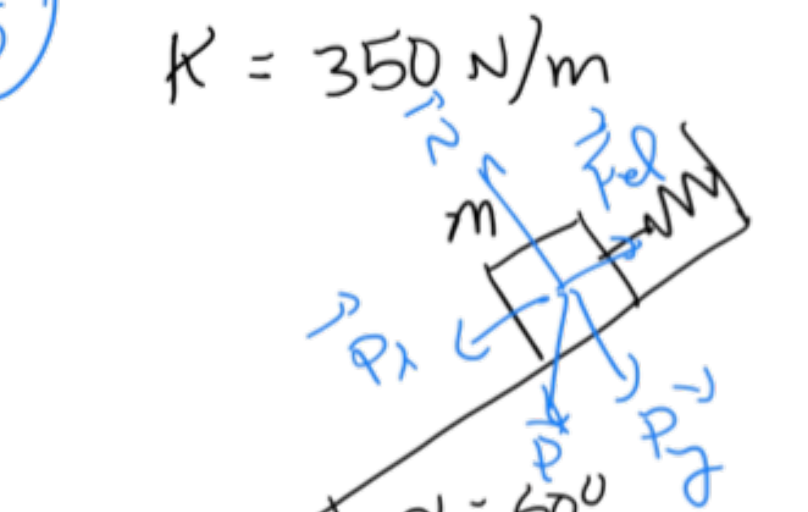
$$F_x - F_f = ma$$

$$61,08 - 72,98 = 20a$$

$$a = \frac{-11,9}{20} = [-0,6 \text{ m/s}^2]$$

5

$$K = 350 \text{ N/m}$$



$$m? \quad \Delta l = 8 \text{ cm} \cdot \frac{1 \text{ m}}{10^2 \text{ cm}} = 0,08 \text{ m}$$

$$\mu = 0$$

$$\text{eix X } P_x - F_{\text{el}} = m \cdot a$$

$$\text{eix Y } P_y - N = 0$$

$$N = P_y = mg \cos \alpha$$

$$P_x = mg \sin \alpha$$

$$F_{\text{el}} = K \cdot \Delta l$$

$$mg \sin \alpha - K \Delta l = m \cdot a$$

$$mg \sin \alpha = K \Delta l$$

$$9,8 \sin 60^\circ m = 350 \cdot 0,08$$

$$m = \frac{280}{8,49} = [32,99 \text{ kg}]$$

6



$$\text{Justu. al punt més alt}$$

$$T = DN$$

$$P = m \cdot a_n = \frac{v^2}{r}$$

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

$$v = \sqrt{r \cdot g} = \sqrt{10 \cdot 9,8} = \sqrt{98} = [9,9 \text{ m/s}^2]$$