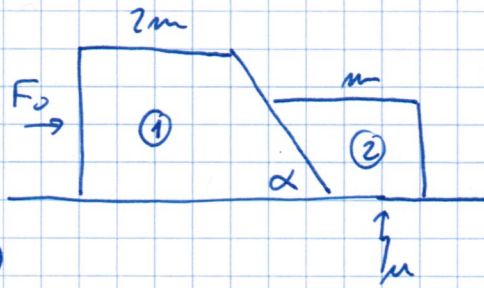


P2



PARTIDA: 4 PTS

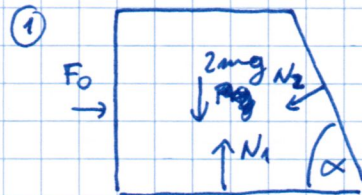
PARTIDA: 2 PTS

Q

1) TUNARLO SIST DE COORD



2) HACERLO DCL



N_2 : REACCION DC2
BLOQUE 2.

EN VECTORES:

$$\vec{F} = F_0 \hat{i} + N_1 \hat{j} - 2mg \hat{j} - N_2 (\sin \alpha \hat{i} + \cos \alpha \hat{j})$$

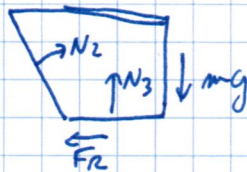
LA CINEMATICA ES:

$$\vec{a}_1 = a \hat{i}$$

NEWTON:

$$\begin{aligned} 2m a &= F_0 - N_2 \sin \alpha \\ 0 &= N_1 - 2mg - N_2 \cos \alpha \end{aligned} \quad \begin{matrix} ① \\ ② \end{matrix}$$

2



$$\vec{F} = N_2 (\sin \alpha \hat{i} + \cos \alpha \hat{j}) + N_3 \hat{j} - mg \hat{j} - F_r \hat{i}$$

LA FEA DE ROCE ES DINAMICO:

$$F_r = \mu N_3$$

1.0

0.5

1.0

LA CINEMATICA E LA DNM: $\ddot{\alpha}_2 = a \hat{e}$

NEWTON: $ma = N_2 \sin \alpha - \mu N_3$ (3)
 $0 = N_2 \cos \alpha + N_3 - mg$ (4)

0.5

4 ECS Y 4 INCOGNITAS: a, N_1, N_2 Y N_3 .
TIENE SOL.

LA EC (2) NO ES RELEVANTE PORQUE SOLO ADECUA UNA INCOGNITA. ENTONCES SE PUEDE RESOLVER.

$$\begin{array}{l} 2ma = F_0 - N_2 \sin \alpha \\ ma = N_2 \sin \alpha - \mu N_3 \\ 0 = N_2 \cos \alpha + N_3 - mg \end{array} \quad \begin{array}{l} (1) \\ (2) \\ (4) \end{array}$$

DE (4): $N_3 = mg - N_2 \cos \alpha$

EN (2) $ma = N_2 \sin \alpha - \mu mg + \mu N_2 \cos \alpha$
 $= N_2 (\sin \alpha + \mu \cos \alpha) - \mu mg$ (5)

DE (1): $N_2 = \frac{F_0 - 2ma}{\sin \alpha}$

EN (5) $ma = \frac{(F_0 - 2ma)(\sin \alpha + \mu \cos \alpha)}{\sin \alpha} - \mu mg$

$$a \cdot \left(1 + \frac{2 \sin \alpha + \mu \cos \alpha}{\sin \alpha}\right) = \frac{F_0 (\sin \alpha + \mu \cos \alpha)}{m \sin \alpha} - \mu g$$

$$a (3 + \mu \cot \alpha) = \frac{F_0}{m} (1 + \mu \cot \alpha) - \mu g$$

$$\boxed{a = \frac{F_0/m (1 + \mu \cot \alpha) - \mu g}{3 + \mu \cot \alpha}} \quad (10)$$

PART b: SE IMPONE LA CONDICIÓN $N_3 = 0$
EN ESTE CASO LAS ECU SON:

$$2ma = F_0 - N_2 \operatorname{sen} \alpha \quad | \quad (1)$$

$$ma = N_2 \operatorname{sen} \alpha \quad | \quad (2)$$

$$0 = N_2 \cos \alpha - mg \quad | \quad (3)$$

$$(1) - 2 \cdot (2): 0 = F_0 - 3N_2 \operatorname{sen} \alpha$$

$$(3): 0 = N_2 \cos \alpha - mg$$

$$\Rightarrow N_2 = mg / \cos \alpha$$

$$\Rightarrow F_0 = 3N_2 \operatorname{sen} \alpha$$

$$\boxed{F_0 = 3mg \operatorname{tg} \alpha}$$

2 PTS: 1 CONDICIÓN
1 DESPEJE