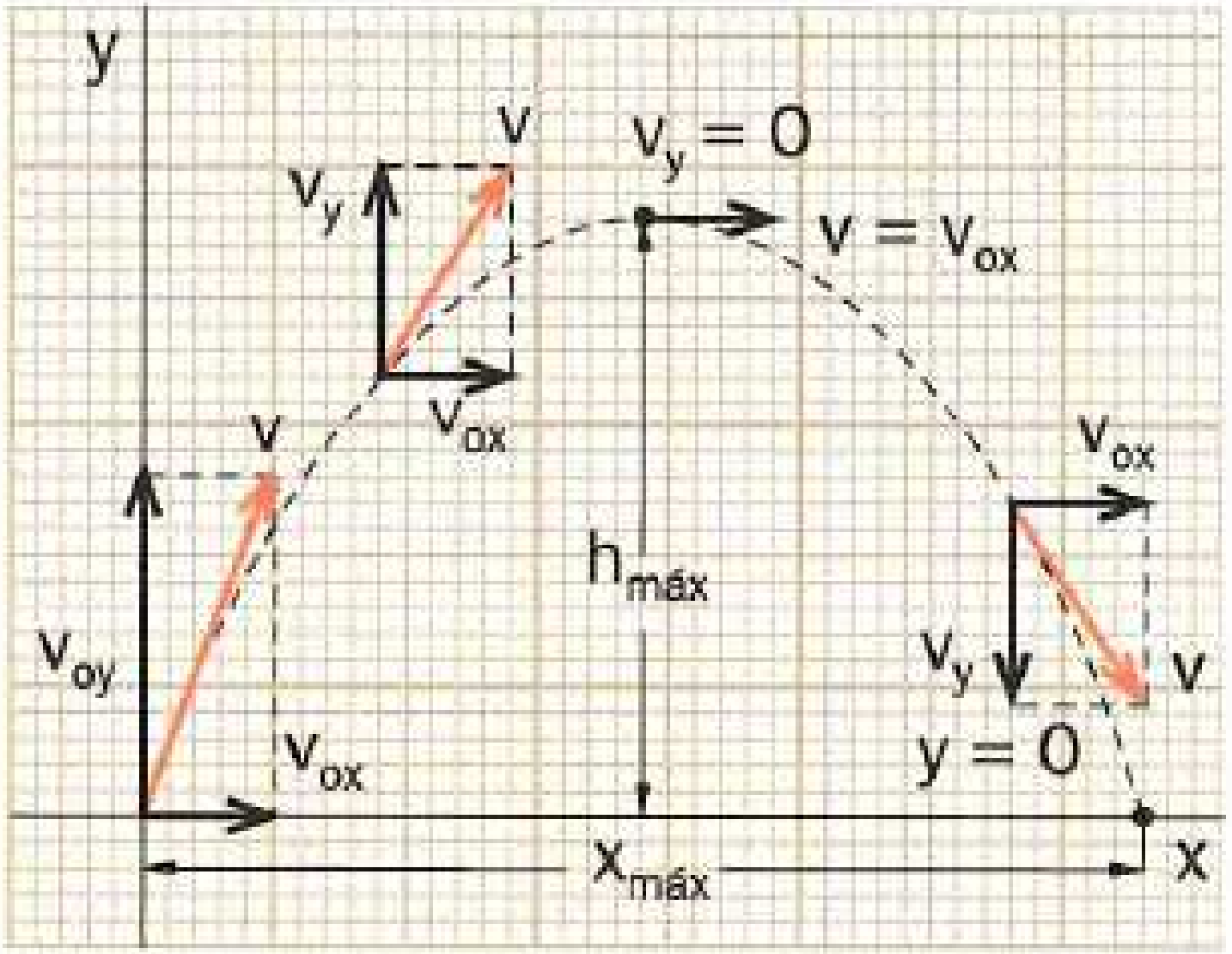
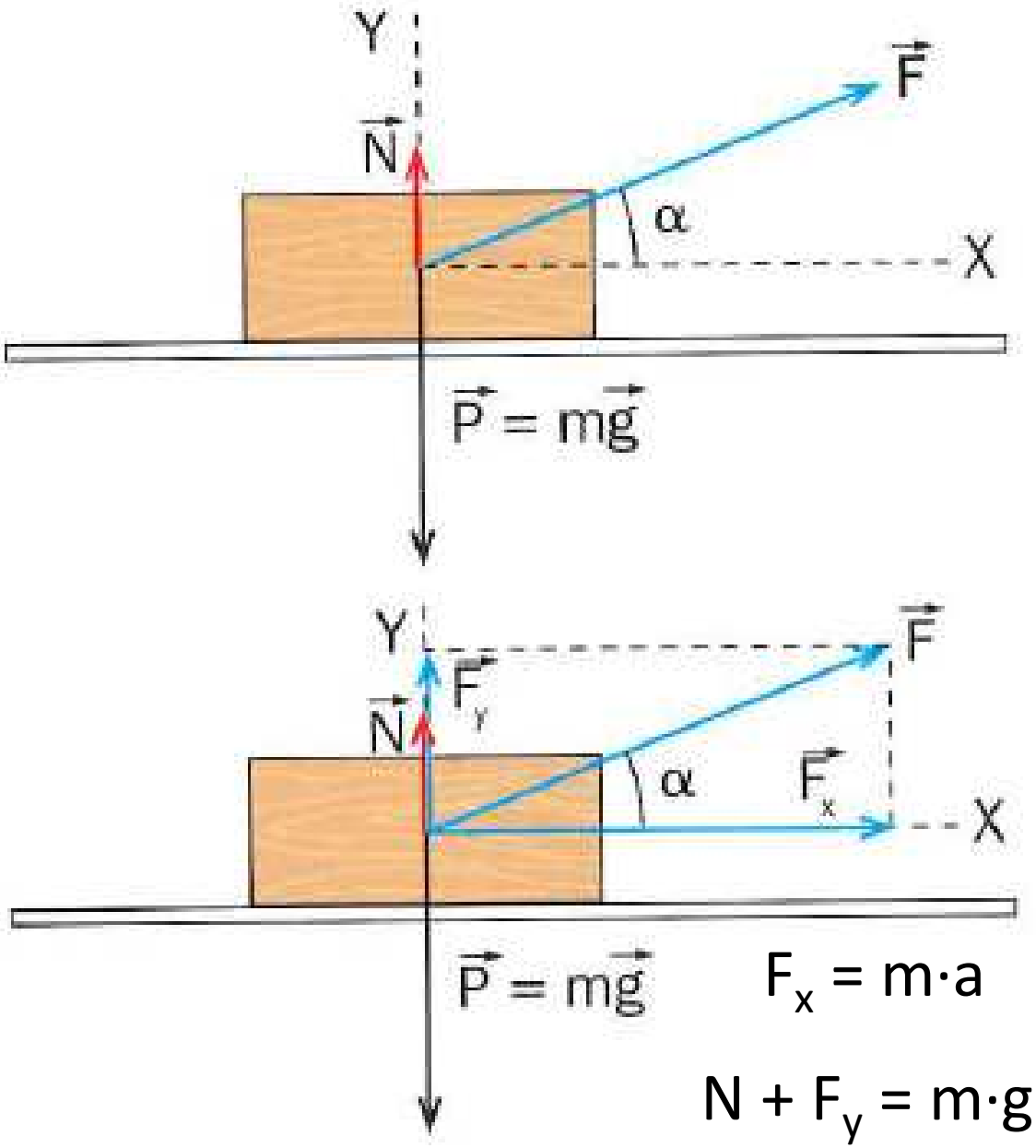
ALTURA MÁXIMA Y ALCANCE



Movimiento sobre un plano horizontal liso

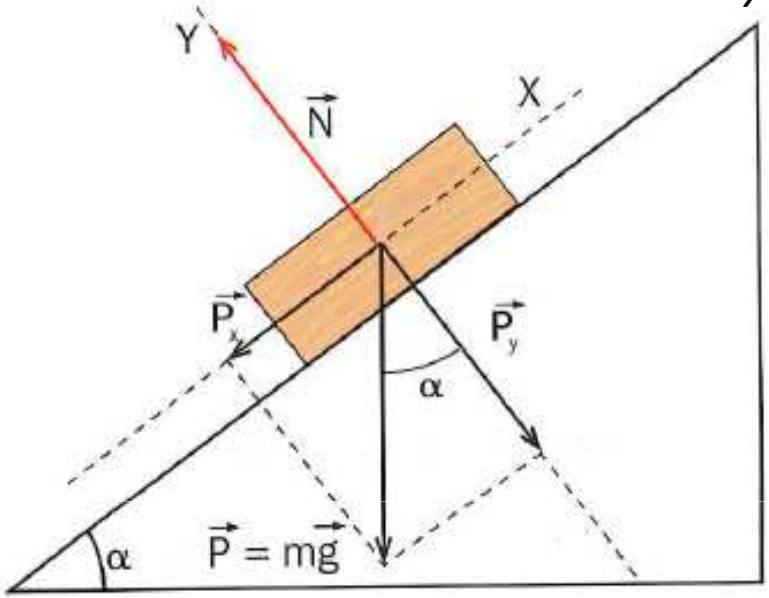


$F_x = m \cdot a \rightarrow \mathbf{F} \cdot \cos\alpha = m \cdot \mathbf{a}$

$N + F_y = m \cdot g \rightarrow N + \mathbf{F} \cdot \text{sen}\alpha = m \cdot g$

Movimiento sobre un plano inclinado liso

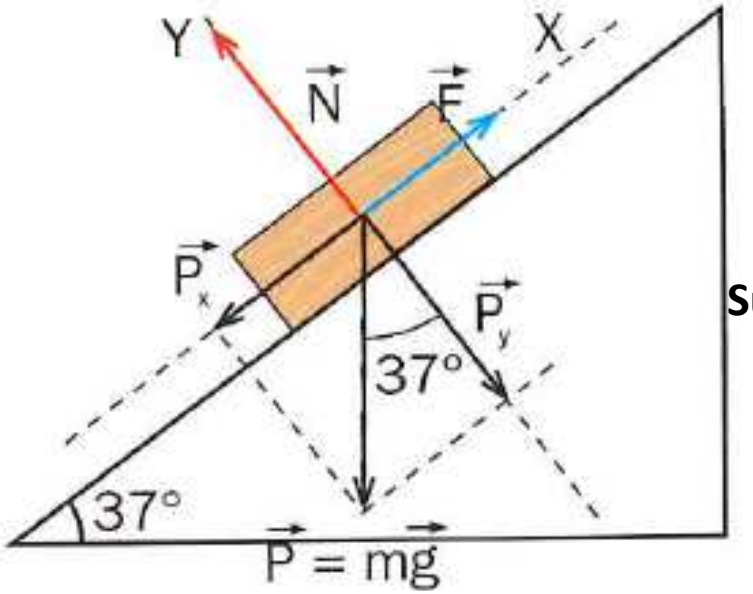
Los ejes de referencia se toman desde la rampa (X)
y su perpendicular pasando por el cuerpo



Caída:

$$P_x = m \cdot a \rightarrow mg \cdot \text{sen}\alpha = m \cdot \mathbf{a}$$

$$N = P_y \rightarrow N = P \cdot \cos\alpha$$



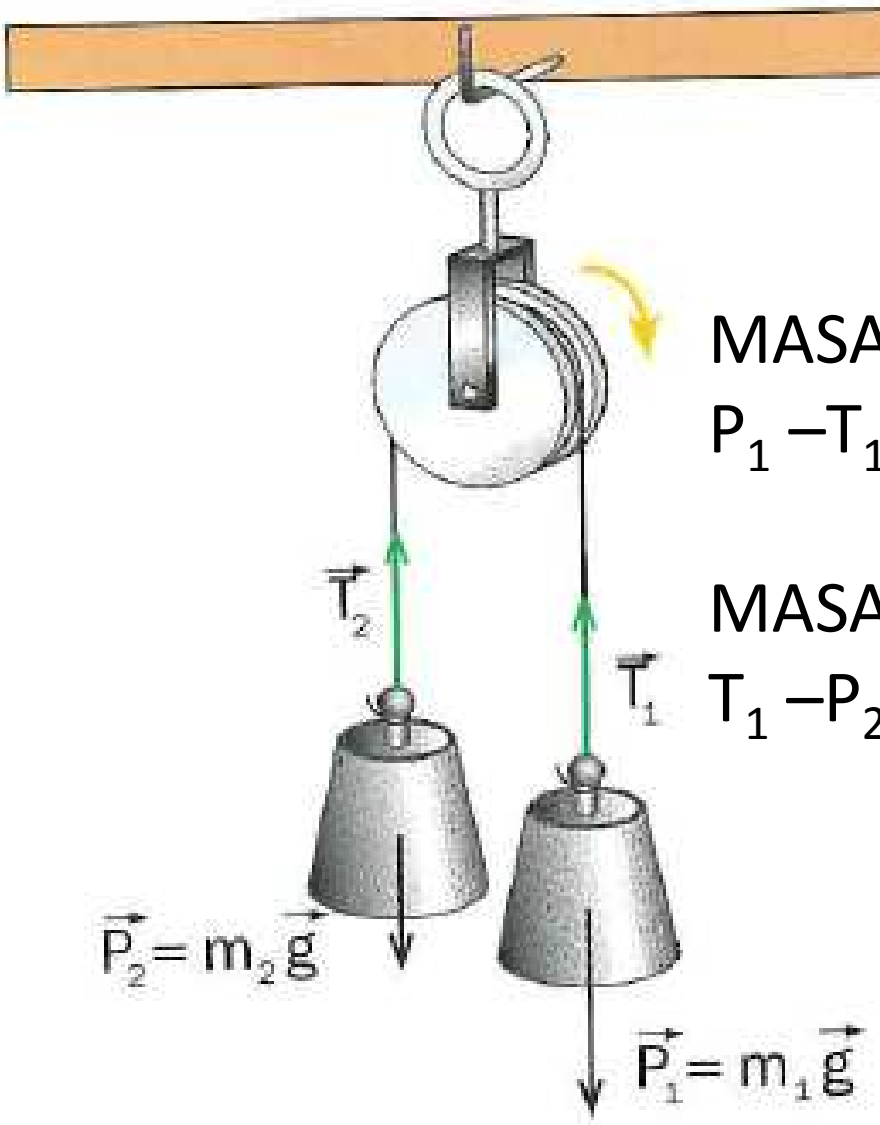
Subida:

$$F - P_x = m \cdot a \rightarrow F - mg \cdot \text{sen}\alpha = m \cdot \mathbf{a}$$

$$N = P_y \longrightarrow N = P \cdot \cos\alpha$$

Cuerpos suspendidos

MÁQUINA DE ATWOOD



✓Las tensiones en ambos lados son iguales:

✓$\mathbf{T_1 = T_2}$.

✓Dos masas, por tanto dos veces Newton:

MASA 1:

$P_1 - T_1 = m_1 \cdot a$

MASA2:

$T_1 - P_2 = m_2 \cdot a$

$m_1 \cdot g - \mathbf{T_1} = m_1 \cdot \mathbf{a}$

$\mathbf{T_1} - m_2 \cdot g = m_2 \cdot \mathbf{a}$

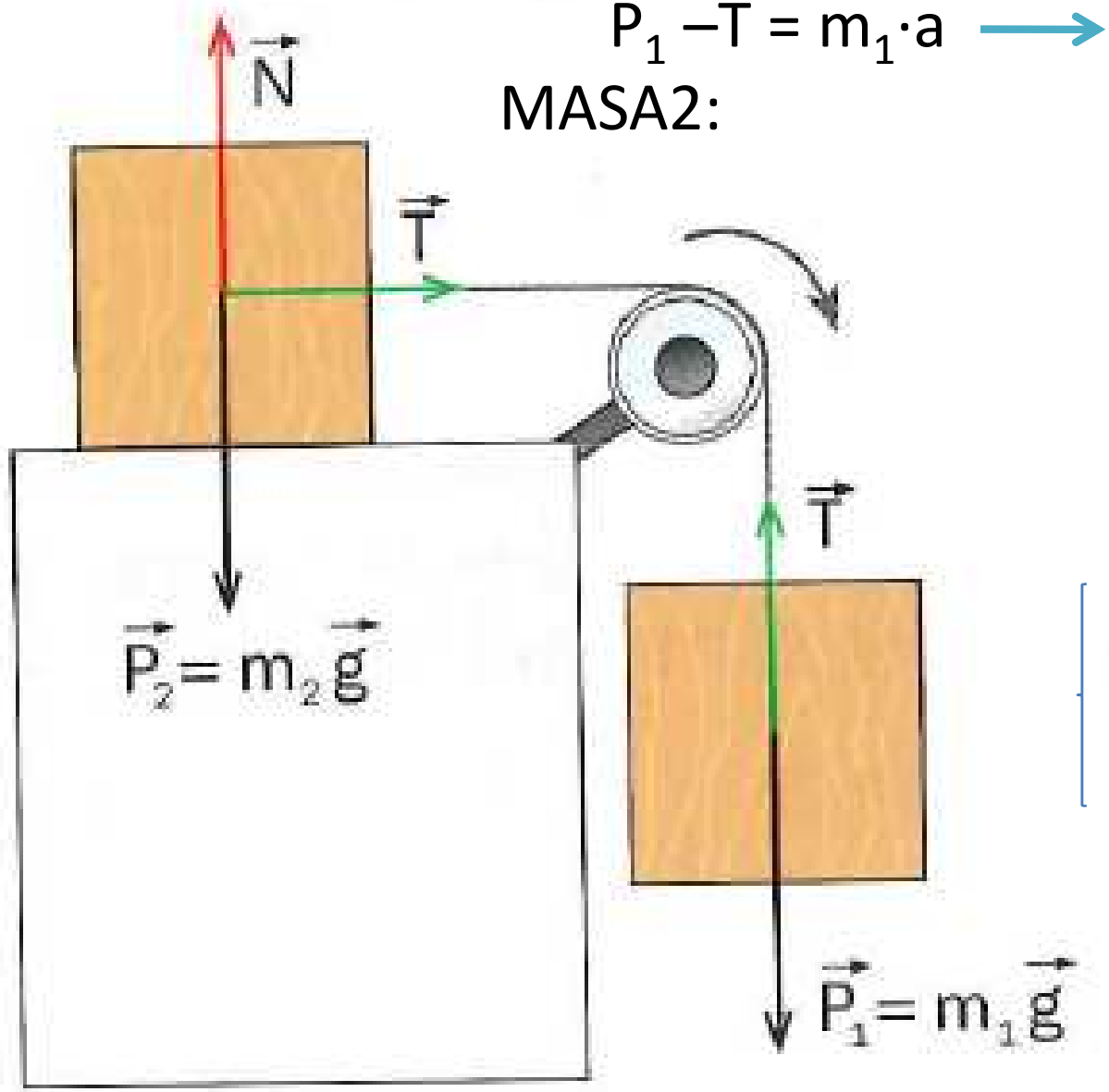
Cuerpos enlazados sobre planos

MASA 1:

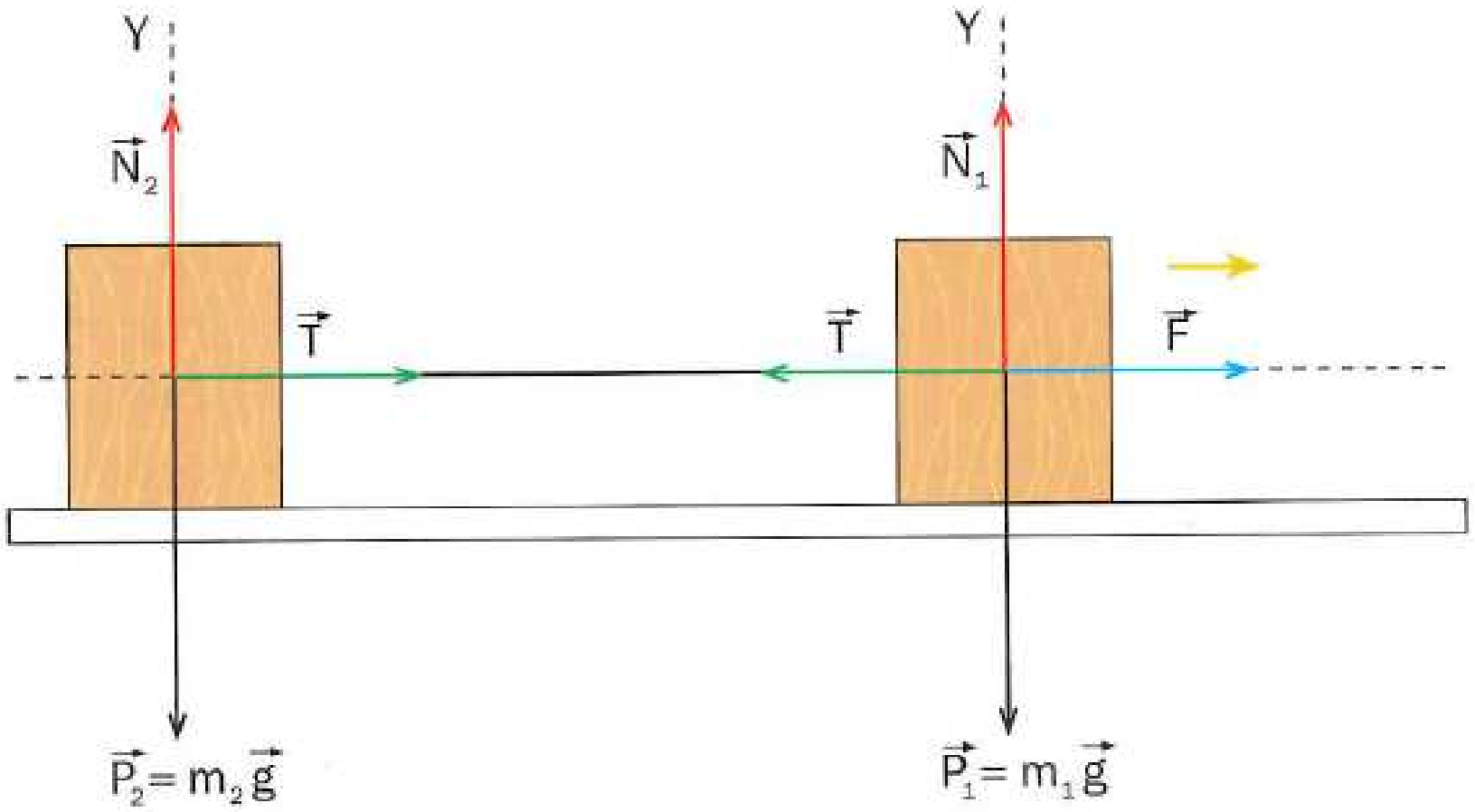
$P_1 - T = m_1 \cdot a \longrightarrow m_1 \cdot g - \mathbf{T} = m_1 \cdot \mathbf{a}$

MASA2:

$\mathbf{T} = m_2 \cdot \mathbf{a}$



Cuerpos enlazados sobre planos

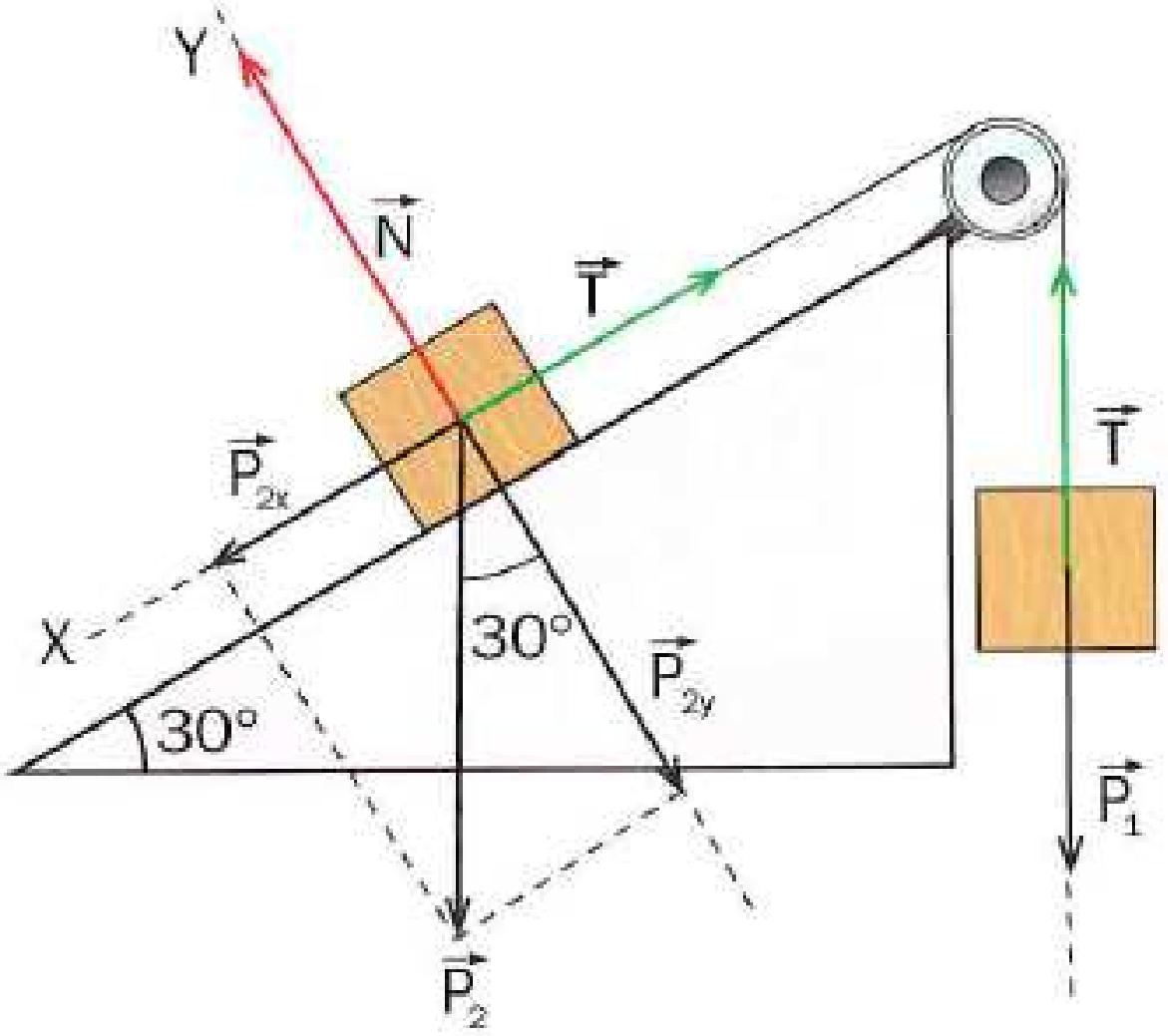


$\mathbf{T} = m_2 \cdot \mathbf{a}$

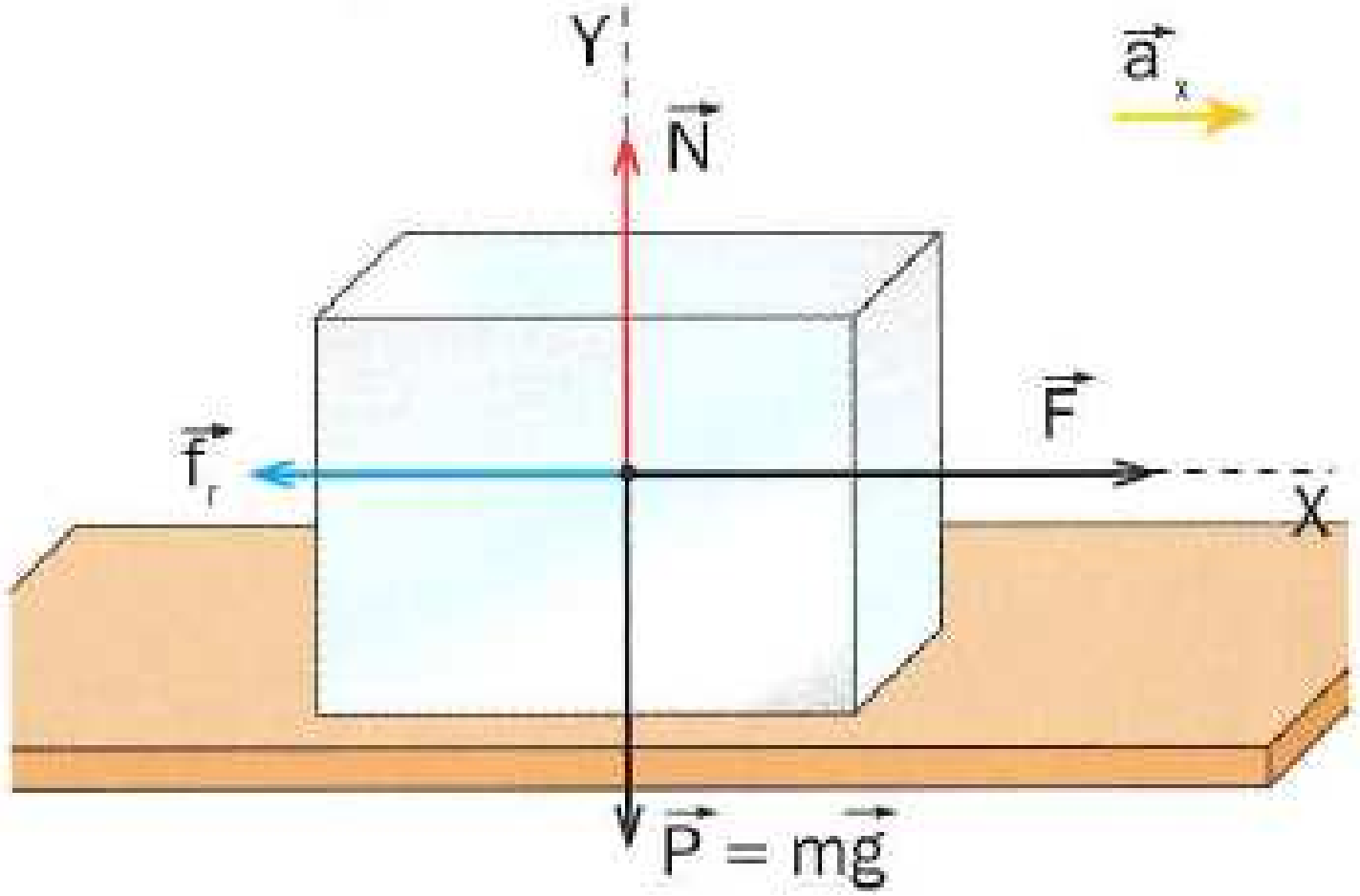
$F - \mathbf{T} = m_1 \cdot \mathbf{a}$

$$\mathbf{T}- m_2 \cdot g \cdot \text{sen}30 = m_2 \cdot \mathbf{a} \qquad P_1 - \mathbf{T} = m_1 \cdot \mathbf{a}$$

Con $N = m_2 \cdot g \cdot \cos 30$



Movimiento de cuerpos sobre planos con rozamiento



N = m·g

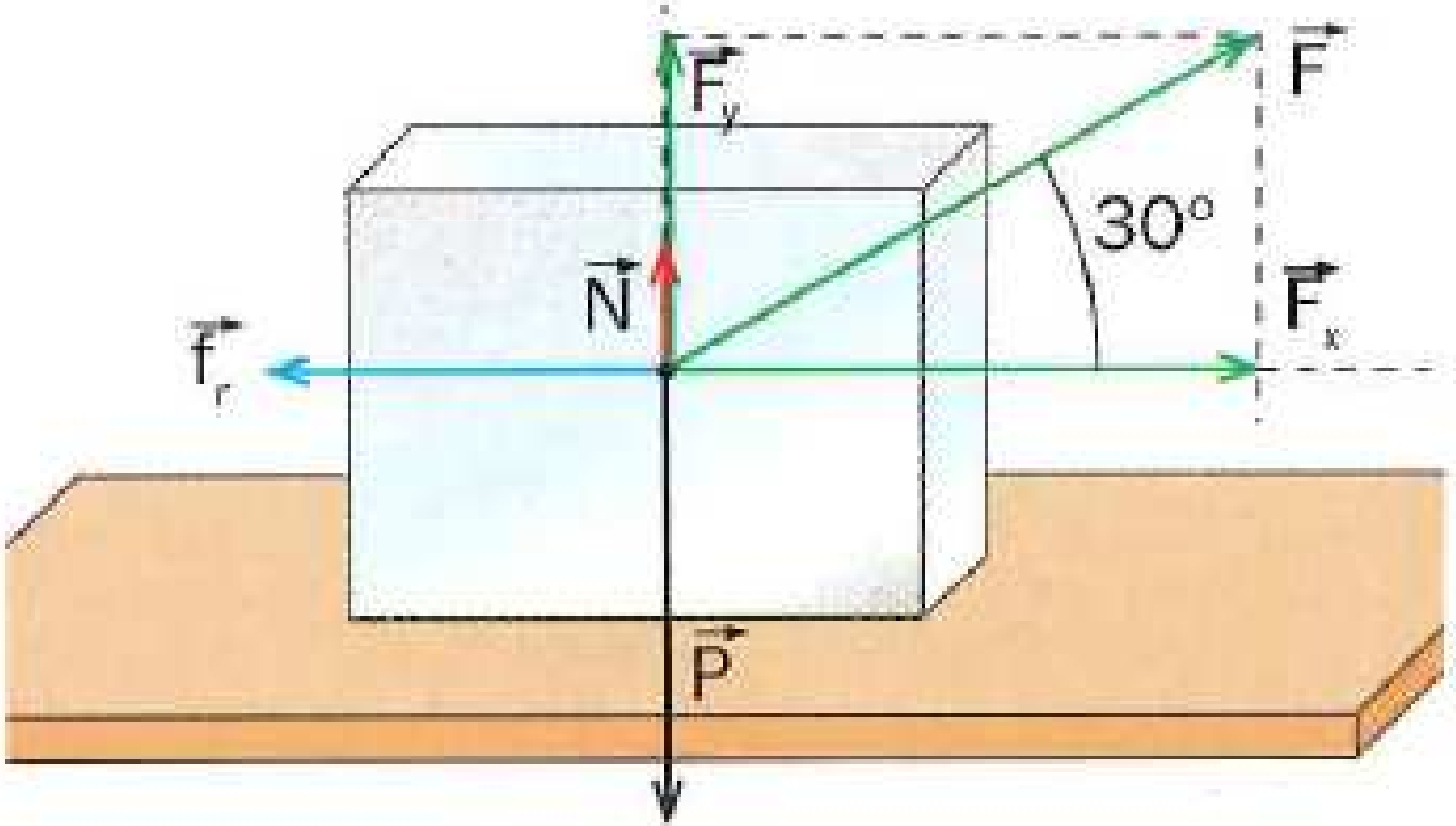
$\mathbf{f_r = \mu \cdot N = \mu \cdot mg}$ ⟶ $F - \mu \cdot mg = m \cdot \mathbf{a}$

Movimiento de cuerpos sobre planos con rozamiento

$P=\mathbf{N}+Fy \longrightarrow \mathbf{N}=P-F_y \longrightarrow \mathbf{N}=mg-F\cdot sen30$;

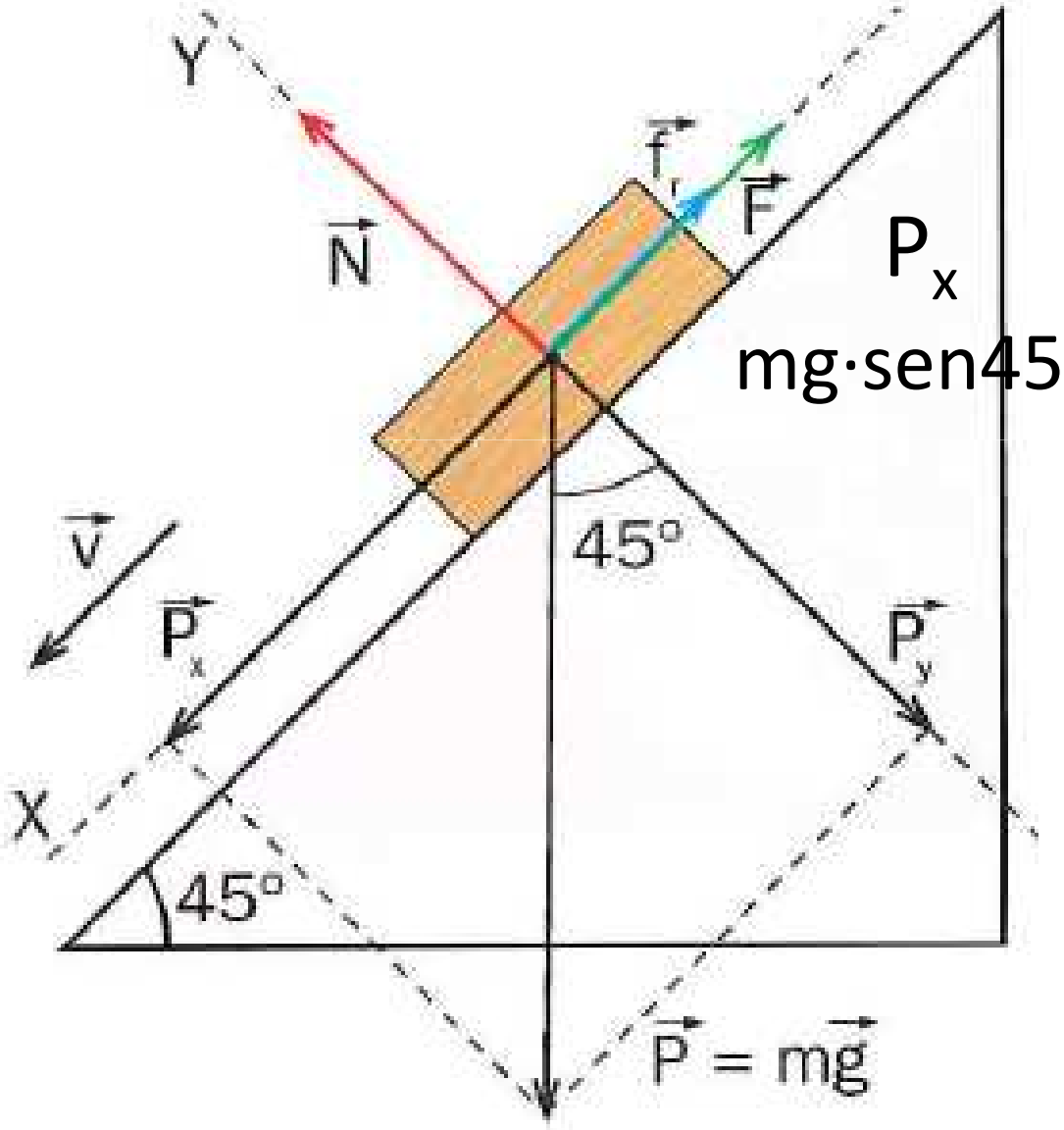
$\mathbf{f_r= \mu\cdot N = \mu\cdot(mg-F\cdot sen30)}$

$F_x - f_r = m\cdot\mathbf{a} \rightarrow F\cdot cos30 - \mu\cdot(mg-F\cdot sen30)=m\cdot\mathbf{a}$



Movimiento de cuerpos sobre planos con rozamiento

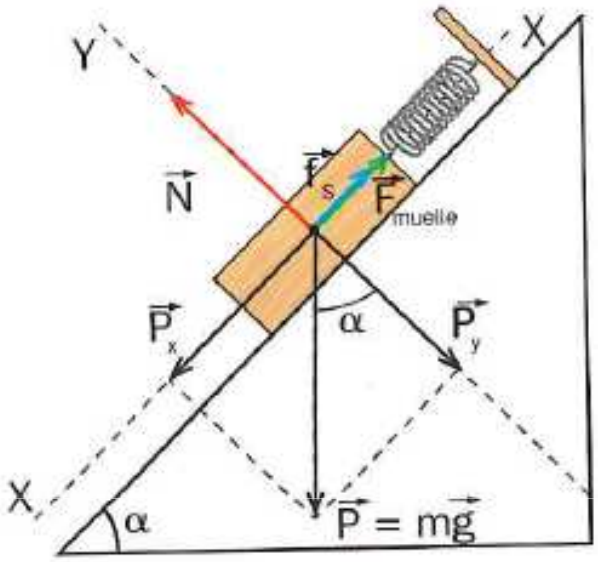
N=P_y ⟶ **N**= mgcos45 $f_r = \mu \cdot N = \mu \cdot mg \cdot \cos 45$



$P_x - F - f_r = m \cdot a$

$mg \cdot sen45 - F - \mu \cdot mg \cdot cos45 = m \cdot \mathbf{a}$

Estudio dinámico del movimiento de cuerpos unidos a muelles

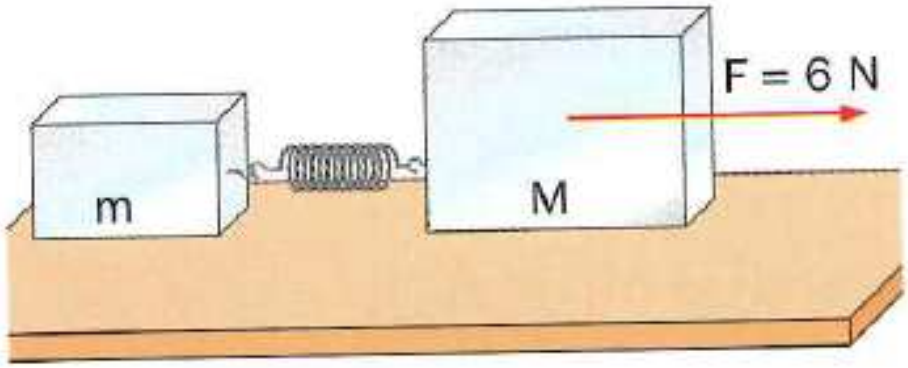


$$P_x - F_{muelle} - f_r = m \cdot a$$

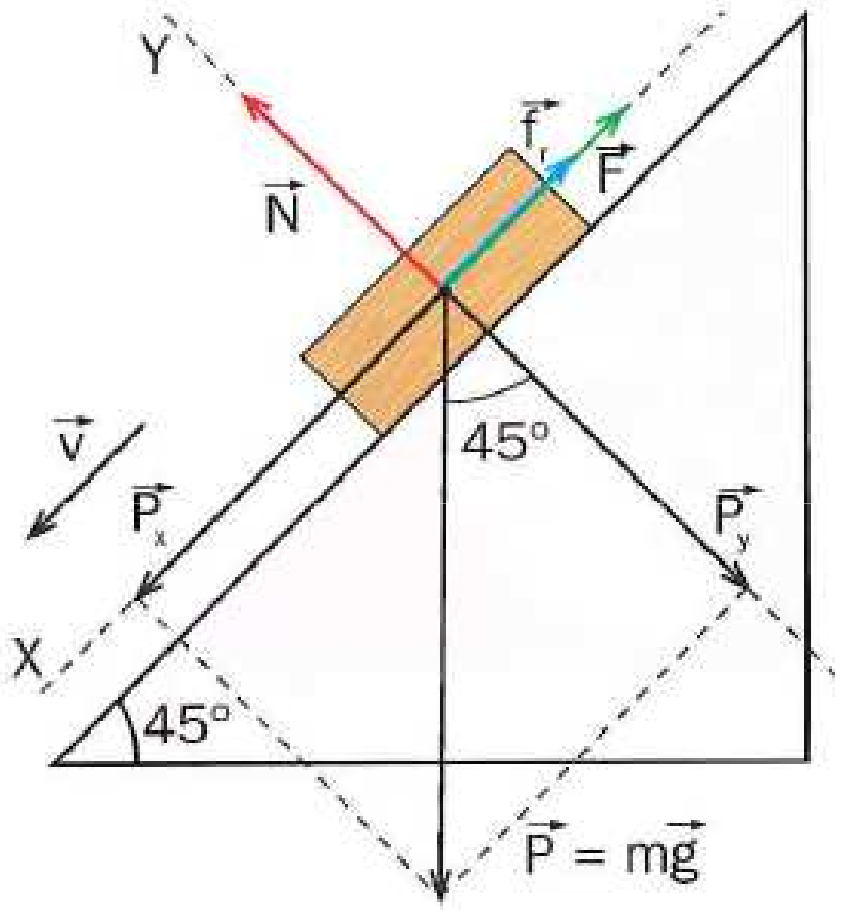
$$mg\,sen\alpha - k \cdot x - \mu \cdot mg\cos\alpha = m \cdot a$$

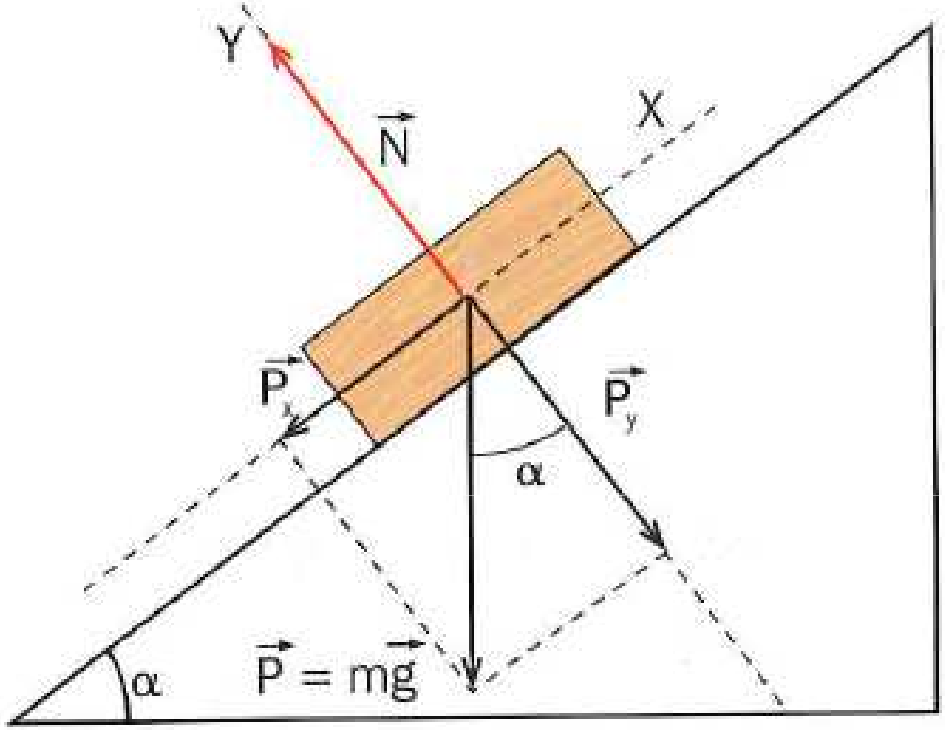
$$F - f_{r1} - F_{muelle} = M \cdot a$$

$$F_{muelle} - f_{r2} = m \cdot a$$



Compara los dos dibujos, ¿Cuál es la diferencia?





$P_x - F - f_r = m \cdot a$

$P_x = m \cdot a$