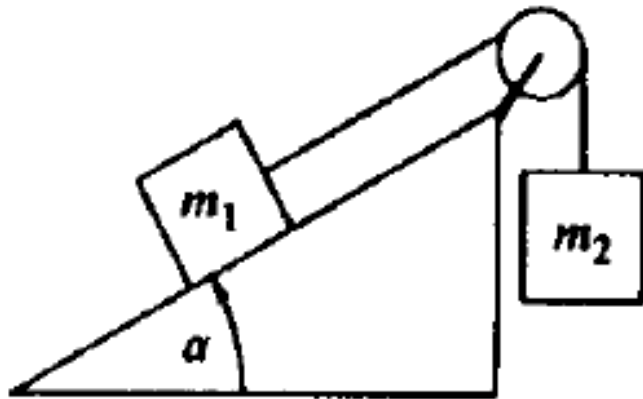


Clase 2 – Ejercicio 15



Datos:

$$m_1 = 20 \text{ kg}$$

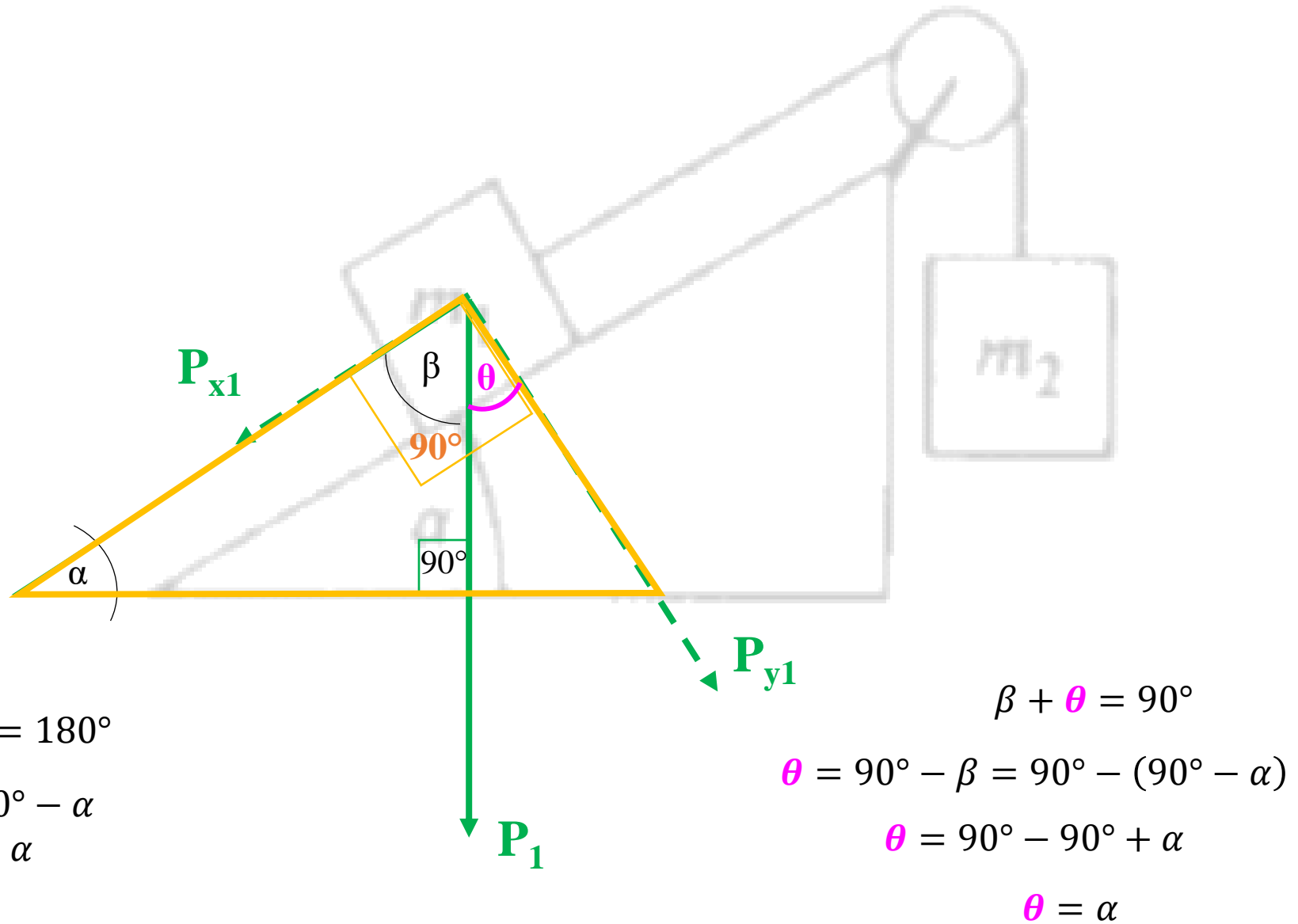
$$m_2 = 18 \text{ kg}$$

$$\alpha = 30^\circ$$

$$\alpha + \beta + 90^\circ = 180^\circ$$

$$\beta = 180^\circ - 90^\circ - \alpha$$

$$\beta = 90^\circ - \alpha$$



$$\sin \alpha = \frac{P_{x1}}{P_1} \quad P_{x1} = P_1 \sin \alpha$$

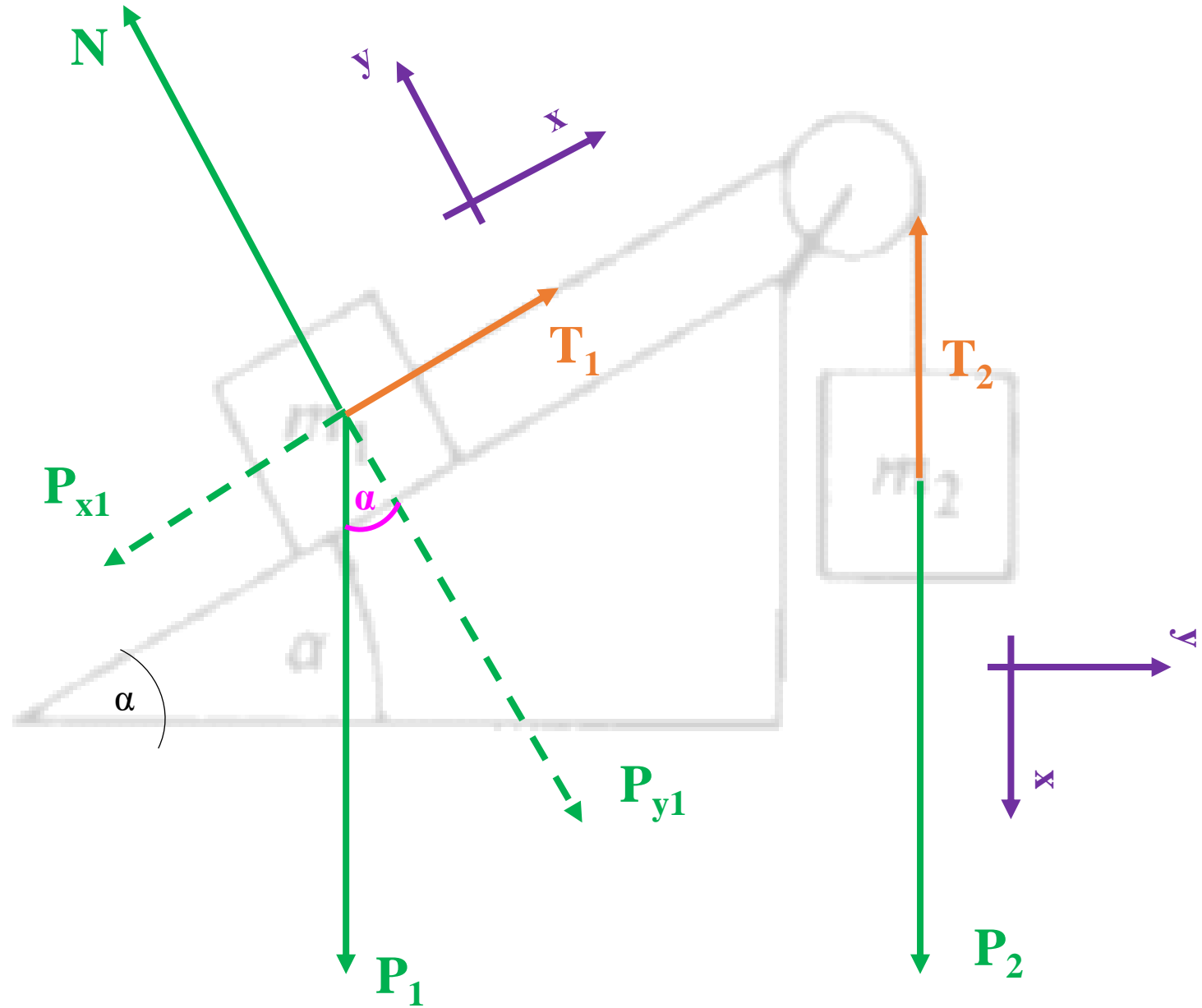
$$\cos \alpha = \frac{P_{y1}}{P_1} \quad P_{y1} = P_1 \cos \alpha$$

$$P_{x1} > P_2?$$

$$P_{x1} = m_1 g \sin \alpha = 98 \text{ N}$$

$$P_2 = m_2 g = 176,4 \text{ N}$$

$$P_2 > P_{x1}$$



Sistema de estudio: **bloque 1**

$$(I) \quad \Sigma F_x = T_1 - P_{x1} = m_1 a$$

$$\Sigma F_y = N - P_{y1} = 0$$

Sistema de estudio: **bloque 2**

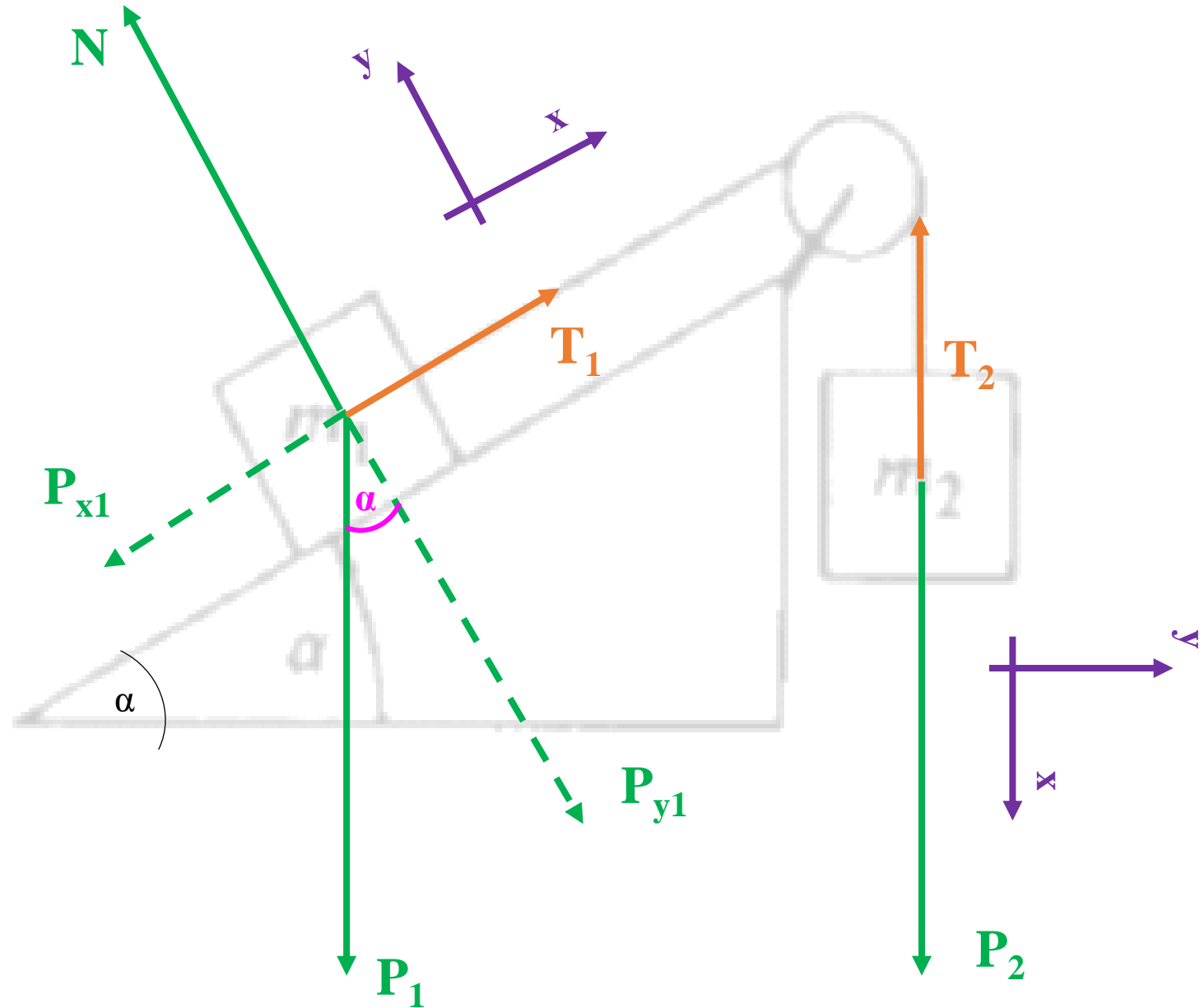
$$(II) \quad \Sigma F_x = P_2 - T_2 = m_2 a$$

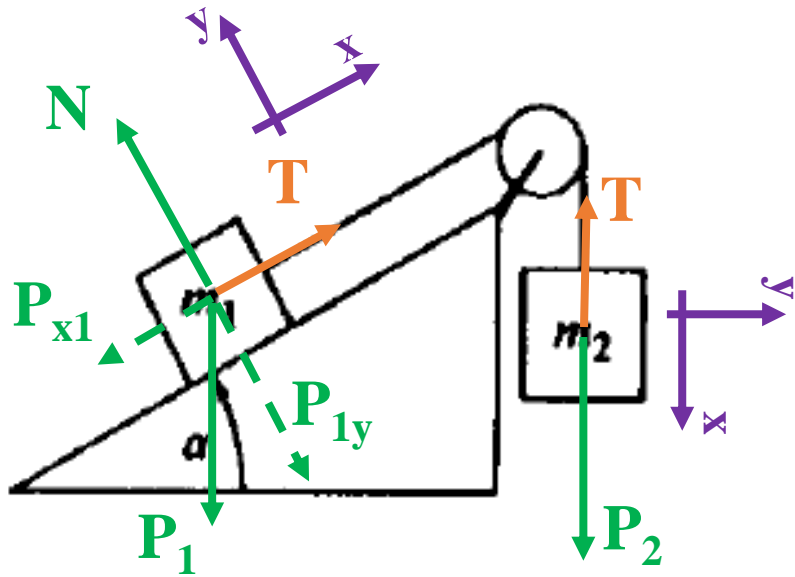
Sistema de estudio: **soga**

$$\Sigma F_x = T_2' - T_1' = m_{soga} a$$

$$|T_1'| = |T_1| \quad T_2' = T_1' = T$$

$$|T_2'| = |T_2|$$





$$\Sigma F_x = T - P_{x1} = m_1 a \quad (\text{I})$$

+

$$\Sigma F_x = P_2 - T = m_2 a \quad (\text{II})$$

$$P_2 - P_{x1} = m_1 a + m_2 a$$

$$m_2 g - m_1 g \sin \alpha = (m_1 + m_2) a$$

$$a = \frac{g(m_2 - m_1 \sin \alpha)}{(m_1 + m_2)}$$

$$a = \frac{9,8 \text{ m/s}^2 (18 \text{ kg} - 20 \text{ kg} \sin 30^\circ)}{(20 \text{ kg} + 18 \text{ kg})}$$

$$P_{x1} = m_1 g \sin \alpha$$

$$P_2 = m_2 g$$

$$a = 2,06 \text{ m/s}^2$$

de (II) $m_2 g - T = m_2 a$

$$T = m_2 g - m_2 a = m_2 (g - a) = 18 \text{ kg} \left(9,8 \frac{\text{m}}{\text{s}^2} - 2,06 \frac{\text{m}}{\text{s}^2} \right)$$

$$T = 139,3 \text{ N}$$