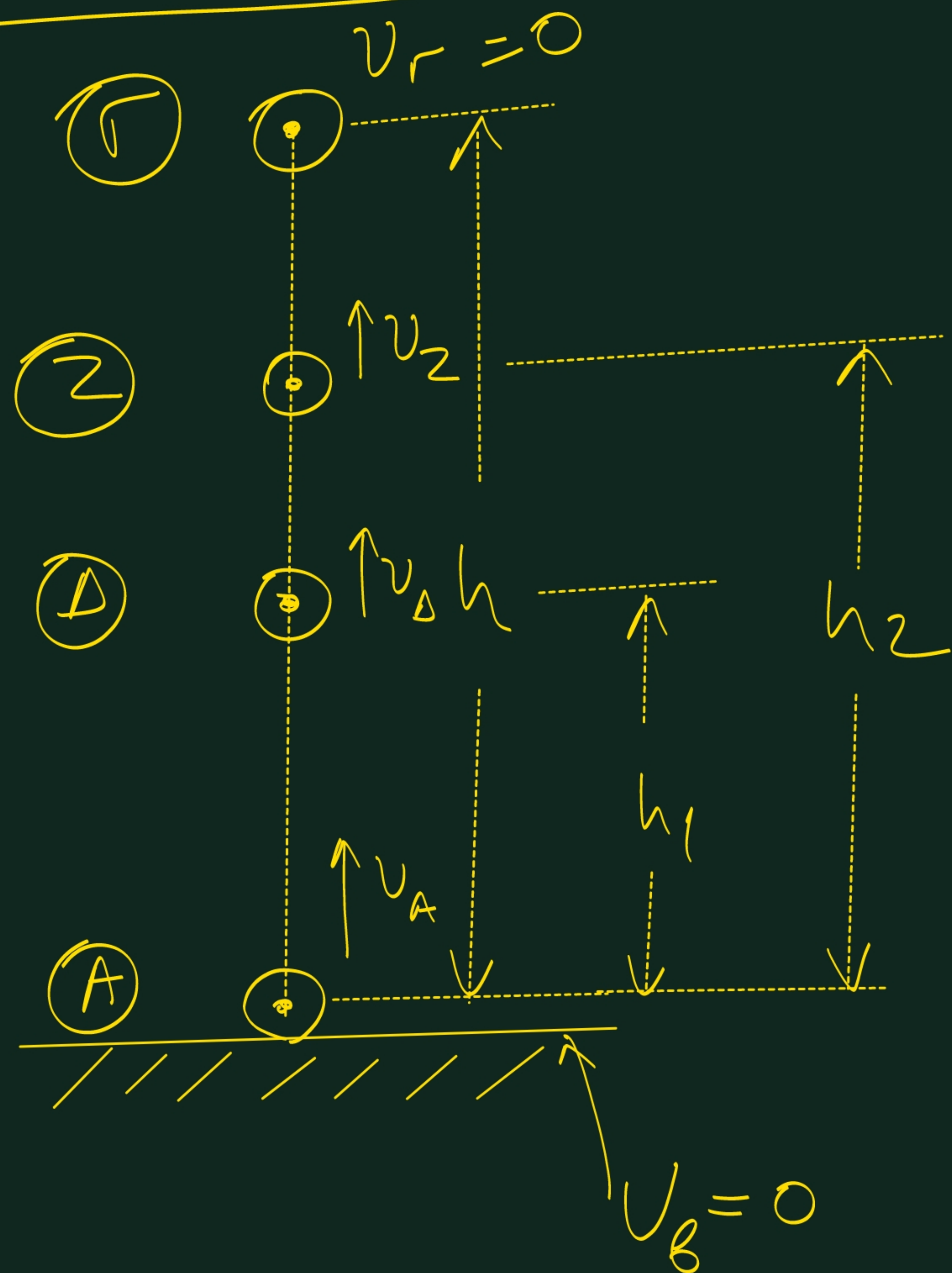


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$$A. \quad k_D = \frac{k_A}{2} \quad h_1 = ;$$

AME: $\textcircled{A} \rightarrow \textcircled{\Gamma}$:

$$k_A + \cancel{U_A} = \cancel{k_\Gamma} + U_\Gamma \Rightarrow$$

$$k_A = m \cdot g \cdot h.$$

AME: $\textcircled{A} \rightarrow \textcircled{\Delta}$:

$$k_A + U_A = k_\Delta + U_\Delta \Rightarrow$$

$$m \cdot g \cdot h + 0 = \frac{k_A}{2} + m \cdot g \cdot h_1 \Rightarrow$$

$$\cancel{m \cdot g \cdot h} = \frac{\cancel{m \cdot g \cdot h}}{2} + \cancel{m \cdot g \cdot h_1} \Rightarrow$$

$$h = \frac{h}{2} + h_1 \Rightarrow 40 = \frac{40}{2} + h_1 \Rightarrow 40 = 20 + h_1 \Rightarrow h_1 = 20 \text{ m}$$

B. Στο (2) έχουμε:

$$P_2 = \frac{P_A}{2} \Rightarrow$$

$$\cancel{m} \cdot v_2 = \frac{\cancel{m} \cdot v_A}{2} \Rightarrow v_2 = \frac{v_A}{2}$$

$$K_2 = \frac{1}{2} \cdot m \cdot v_2^2 = \frac{1}{2} \cdot m \cdot \left(\frac{v_A}{2}\right)^2 =$$

$$= \frac{1}{4} \cdot \frac{1}{2} \cdot m \cdot v_A^2 = \frac{1}{4} \cdot K_A$$

ΑΔΜΕ: (A) $\rightarrow$ (2): $K_A + U_A = K_2 + U_2 \Rightarrow$

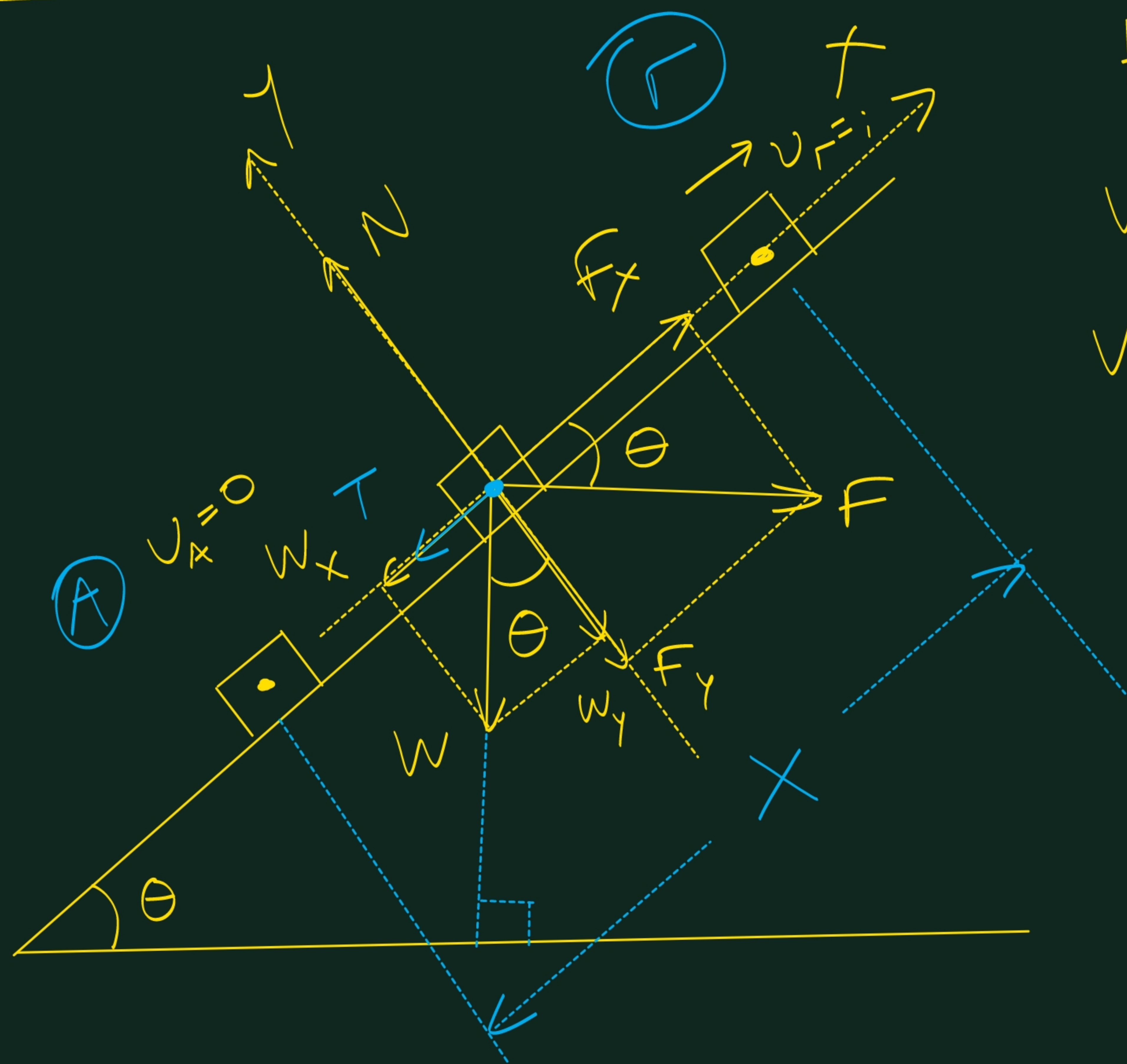
$$K_A + 0 = \frac{K_A}{4} + m \cdot g \cdot h_2 \Rightarrow \cancel{m} \cdot g \cdot h = \frac{\cancel{m} \cdot g \cdot h}{4} + \cancel{m} \cdot g \cdot h_2 \Rightarrow h = \frac{h}{4} + h_2 \Rightarrow$$

Ορμή: $P = m \cdot v$

$$40 = \frac{40}{4} + h_2 \Rightarrow$$

$$40 = 10 + h_2 \Rightarrow h_2 = 30 \text{ m}$$

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$v_{\text{center of mass}} = v_{\text{point A}} = v = 0,4$

$$F_x = F \cdot \cos \theta$$

$$F_y = F \cdot \sin \theta$$

$$W_x = m \cdot g \cdot \cos \theta$$

$$W_y = m \cdot g \cdot \sin \theta$$

$$\Sigma F_y = 0 \Rightarrow N - W_y - F_y = 0 \Rightarrow$$

$$N = W_y + F_y \Rightarrow$$

$$N = m \cdot g \cdot \sin \theta + F \cdot \sin \theta \Rightarrow$$

$$N = 5 \cdot 10 \cdot 0,8 + 100 \cdot 0,6 \Rightarrow$$

$$N = 40 + 60 \Rightarrow N = 100 \text{ N}$$

$$T = \mu \cdot N = 0,4 \cdot 100 \Rightarrow \boxed{T = 40 \text{ N}}$$