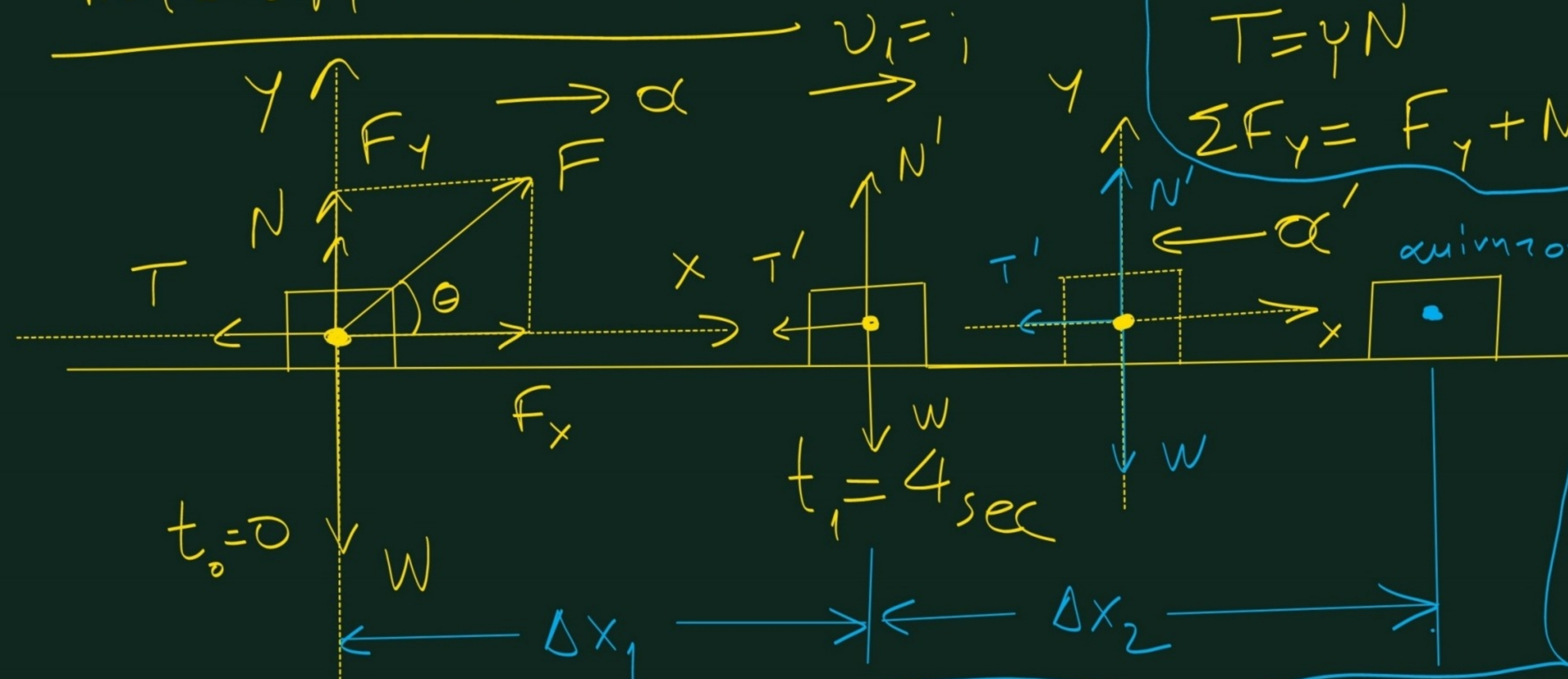


Παράδειγμα άσκησης.



$$F = 100 \text{ N} \quad m = 10 \text{ kg}$$

$$\cos \theta = 0,6 \quad \mu = 0,2$$

$$\sin \theta = 0,8$$

$$\Sigma F_x = m\alpha \Rightarrow F_x - T = m\alpha \Rightarrow$$

$$F \cdot \cos \theta - T = m\alpha \Rightarrow 100 \cdot 0,8 - 8 = 10\alpha \Rightarrow$$

$$80 - 8 = 10\alpha \Rightarrow \alpha = 7,2 \text{ m/s}^2$$

α) Να βρεθεί η επιτάχυνση

$$T = \mu N$$

$$\Sigma F_y = F_y + N - W = 0 \Rightarrow N = W - F_y \Rightarrow$$

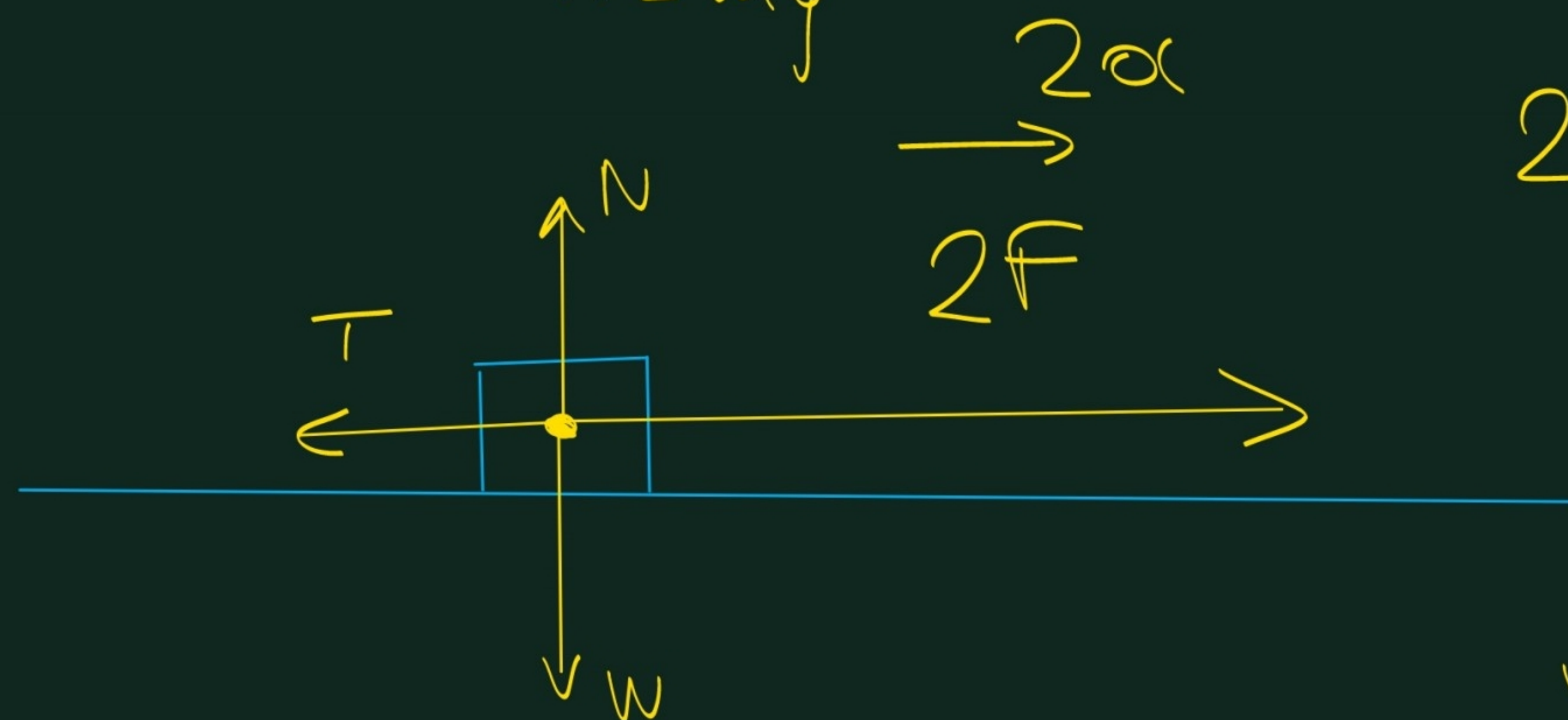
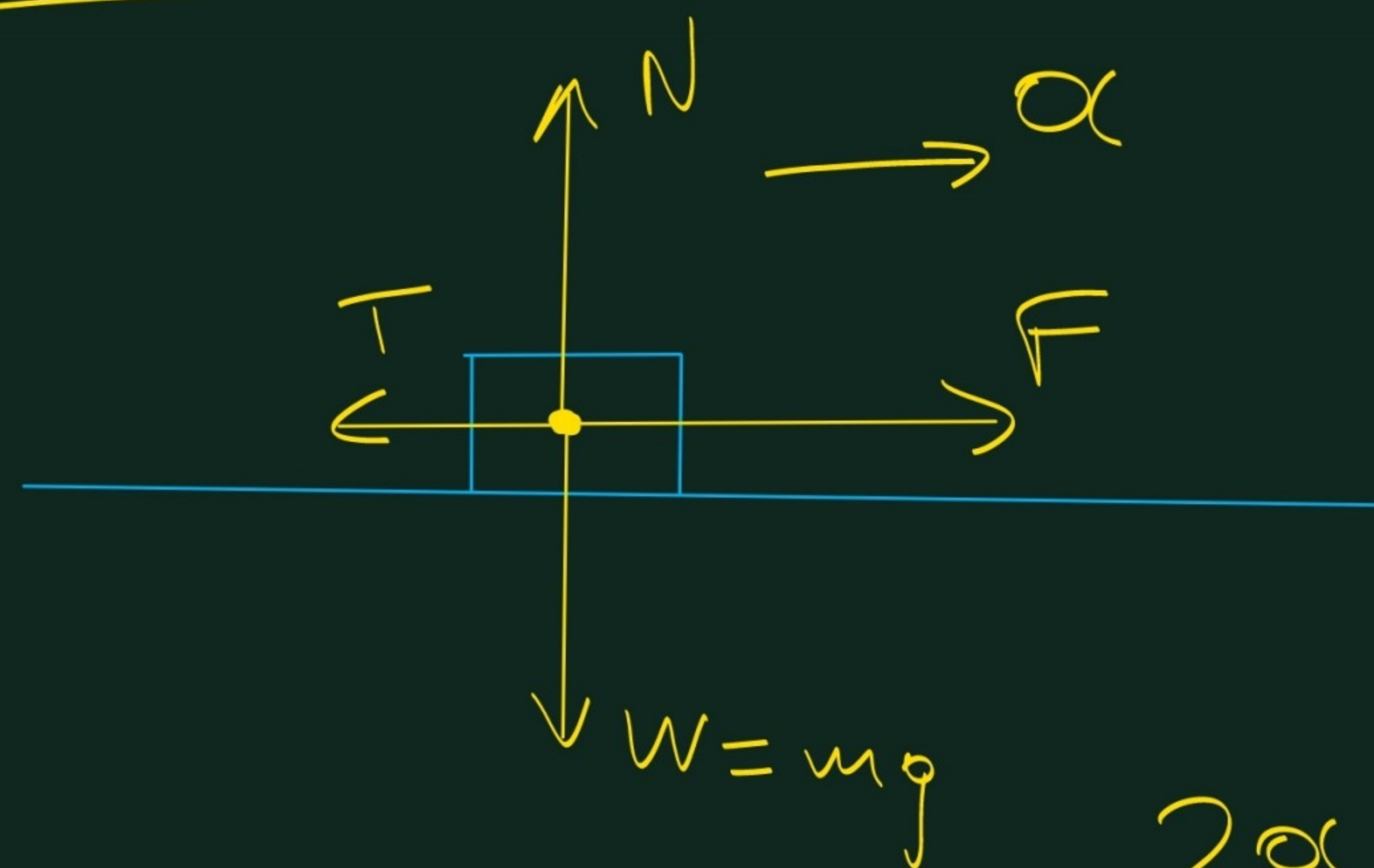
$$N = mg - F \cdot \sin \theta \Rightarrow$$

$$N = 100 - 10 \cdot 0,6 \Rightarrow$$

$$N = 40 \text{ N}$$

$$T = 0,2 \cdot 40 = 8 \text{ N}$$

Ερ. 30 εε2. 153.)



Η τριβή γένει ίδια.

$$\Sigma F_y = 0 \Rightarrow N - W = 0 \Rightarrow N = mg.$$

$$T = \mu N \Rightarrow T = \mu mg.$$

$$\text{Αρα: } F - T = ma \quad (1^{\text{η}} \text{ περίπτωση})$$

$$2F - T = m \cdot 2a \quad (2^{\text{η}} \text{ "})$$

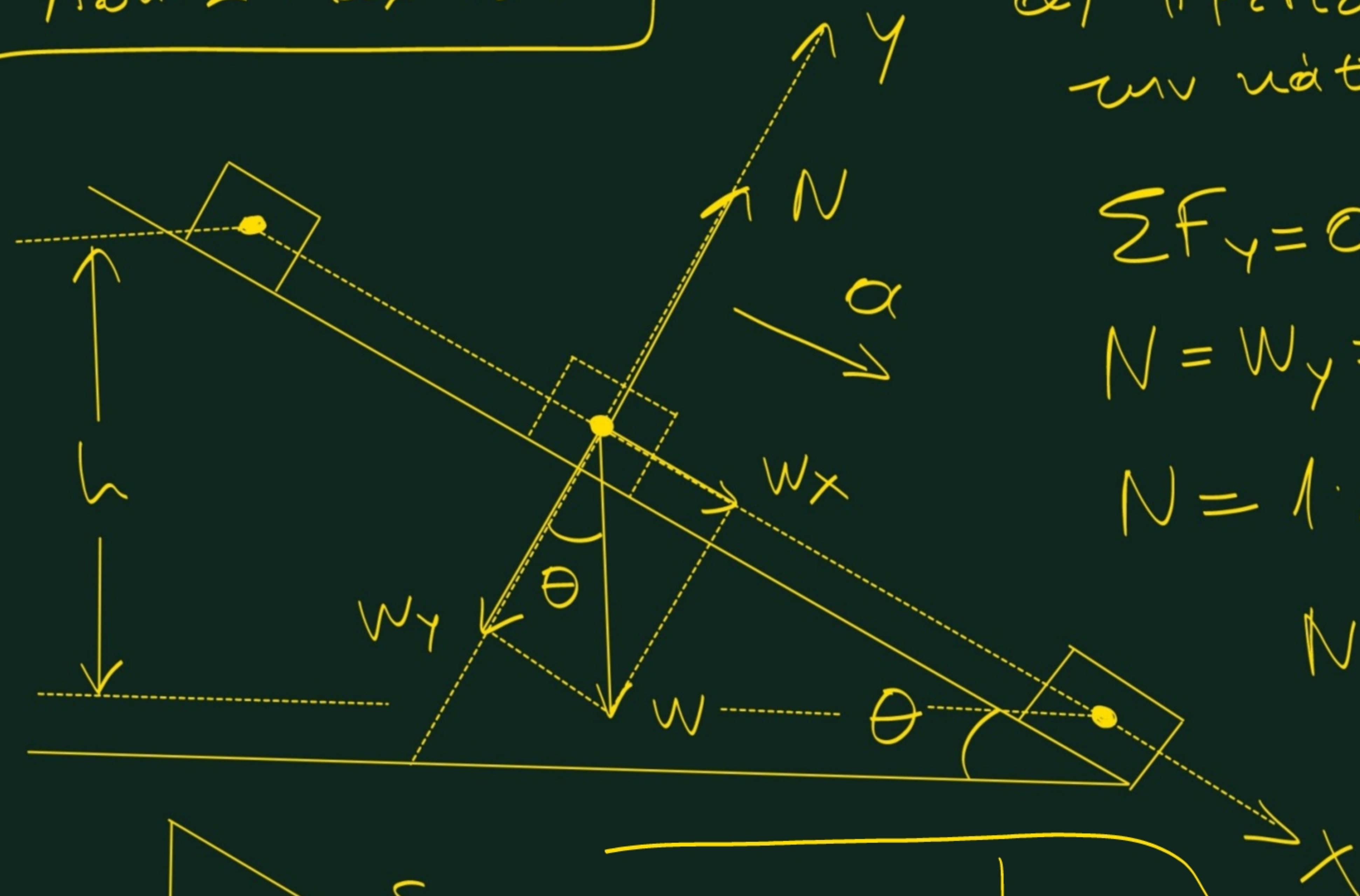
$$2F - T = 2ma \Rightarrow$$

$$2F - T = 2(F - T) \Rightarrow$$

$$\cancel{2F} - T = \cancel{2F} - 2T \Rightarrow 2T - T = 0 \Rightarrow T = 0$$

Αρα δεν υπάρχει τριβή.

Αδ. 24 βελ. 159.



α) Πρέπει να βρούμε
την κάθετη δύναμη N .

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

$$N = W_y \Rightarrow N = mg \cdot \sin \theta \Rightarrow$$

$$N = 1 \cdot 10 \cdot \sin 30^\circ \Rightarrow$$

$$N = 10 \cdot \frac{\sqrt{3}}{2} \Rightarrow$$

$$N = 5\sqrt{3} \text{ N.}$$

$$\beta) \Sigma F_x = ma \Rightarrow$$

$$W_x = ma \Rightarrow$$

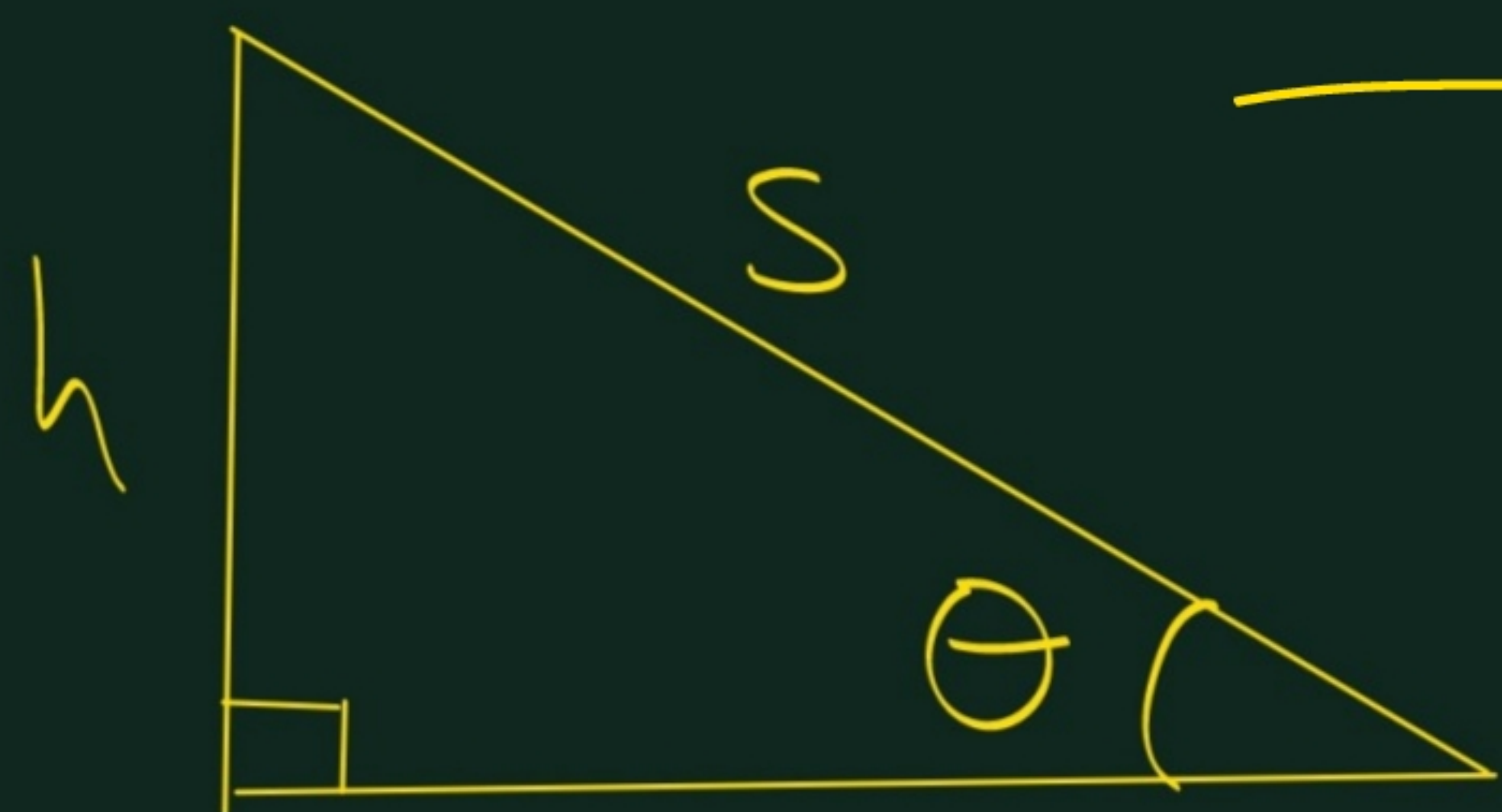
$$W \cdot \sin \theta = ma \Rightarrow$$

$$\cancel{m} \cdot g \cdot \sin \theta = \cancel{m} a \Rightarrow$$

$$a = g \cdot \sin \theta \Rightarrow$$

$$a = 10 \cdot \sin 30^\circ \Rightarrow$$

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



$$\sin \theta = \frac{h}{S} \Rightarrow$$

$$S = \frac{h}{\sin \theta} \Rightarrow S = \frac{5}{\sin 30^\circ} \Rightarrow S = \frac{5}{\frac{1}{2}} \Rightarrow S = 10 \text{ m}$$

$$\gamma) S = \frac{1}{2} a t^2 \Rightarrow$$

$$10 = \frac{1}{2} \cdot 5 \cdot t^2 \Rightarrow$$

$$20 = 5t^2 \Rightarrow t^2 = 4 \Rightarrow$$

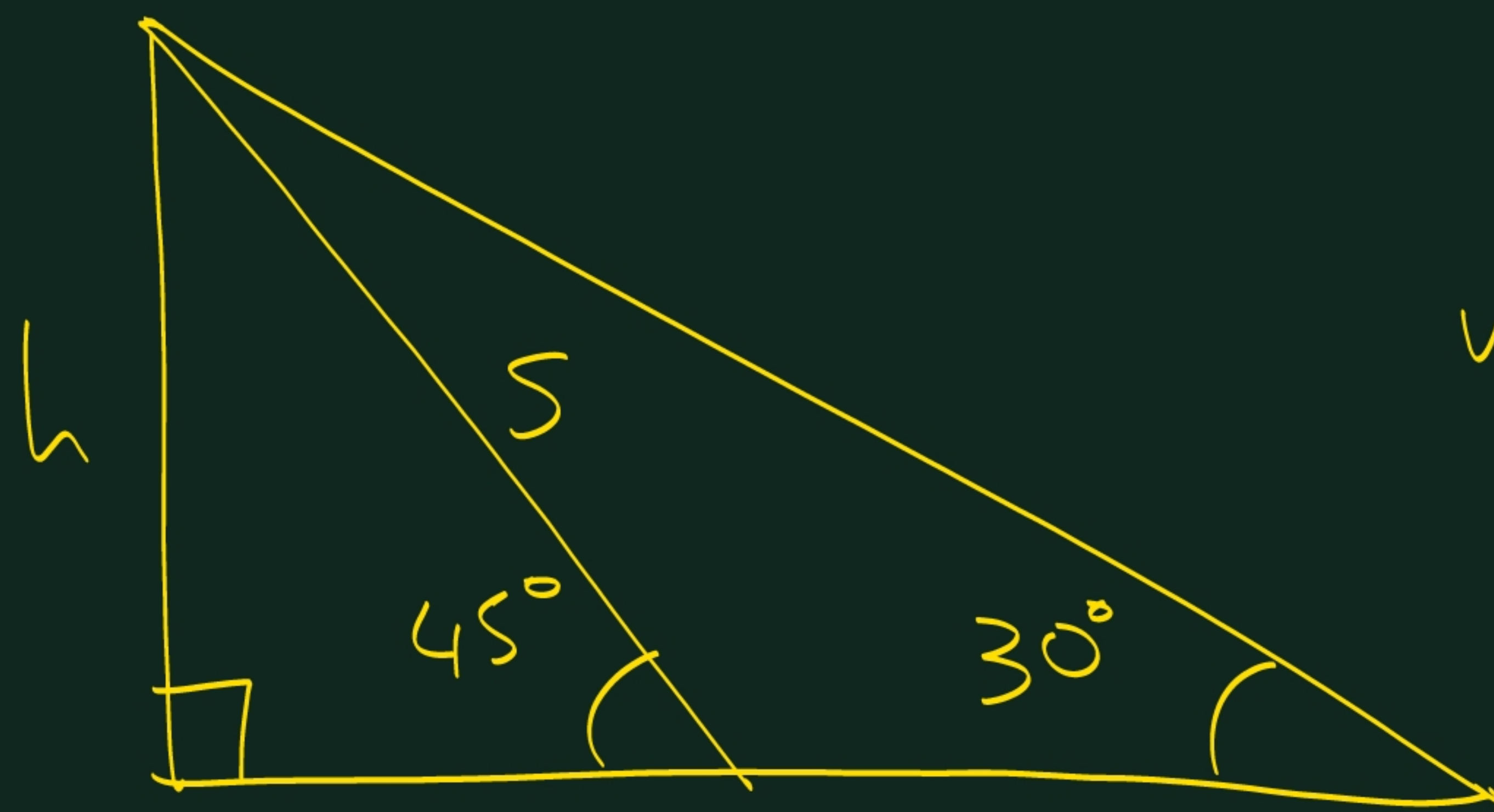
$$t = 2 \text{ sec}$$

$$v = a t \Rightarrow$$

$$v = 5 \cdot 2 \Rightarrow$$

$$v = 10 \text{ m/s}$$

δ) Να ξαναχτίσουν όλοι οι
παράλληλο υπολογισμοί για
το ίδιο ύψος $h = 5 \text{ m}$ αλλά
για $\theta = 45^\circ$



$$\Sigma F_x = m a \Rightarrow$$

$$m g \cdot \sin \theta = m a \Rightarrow$$

$$a = g \cdot \sin \theta = 10 \cdot \sin 45^\circ \Rightarrow$$

$$a = 10 \cdot \frac{\sqrt{2}}{2} \Rightarrow a = 5\sqrt{2} \text{ m/s}^2$$

$$\sin 45^\circ = \frac{h}{S} \Rightarrow \frac{\sqrt{2}}{2} = \frac{5}{S} \Rightarrow$$

$$S = \frac{5}{\frac{\sqrt{2}}{2}} = \frac{10}{\sqrt{2}} = \frac{10\sqrt{2}}{\sqrt{2}^2} = 5\sqrt{2} \text{ m.}$$

$$S = \frac{1}{2} a t^2 \Rightarrow 5\sqrt{2} = \frac{1}{2} \cdot 5\sqrt{2} \cdot t^2 \Rightarrow t^2 = 2 \Rightarrow t = \sqrt{2} \text{ sec}$$

$$v = a t = 5\sqrt{2} \cdot \sqrt{2} \Rightarrow v = 10 \text{ m/s} \text{ ή } \left(\begin{array}{l} \text{αφού: } m g h = \frac{1}{2} m v^2 \Rightarrow \\ v = \sqrt{2 g h} \end{array} \right)$$

