

D3, 3 Innenrie

17-45 min

①

① Dano:

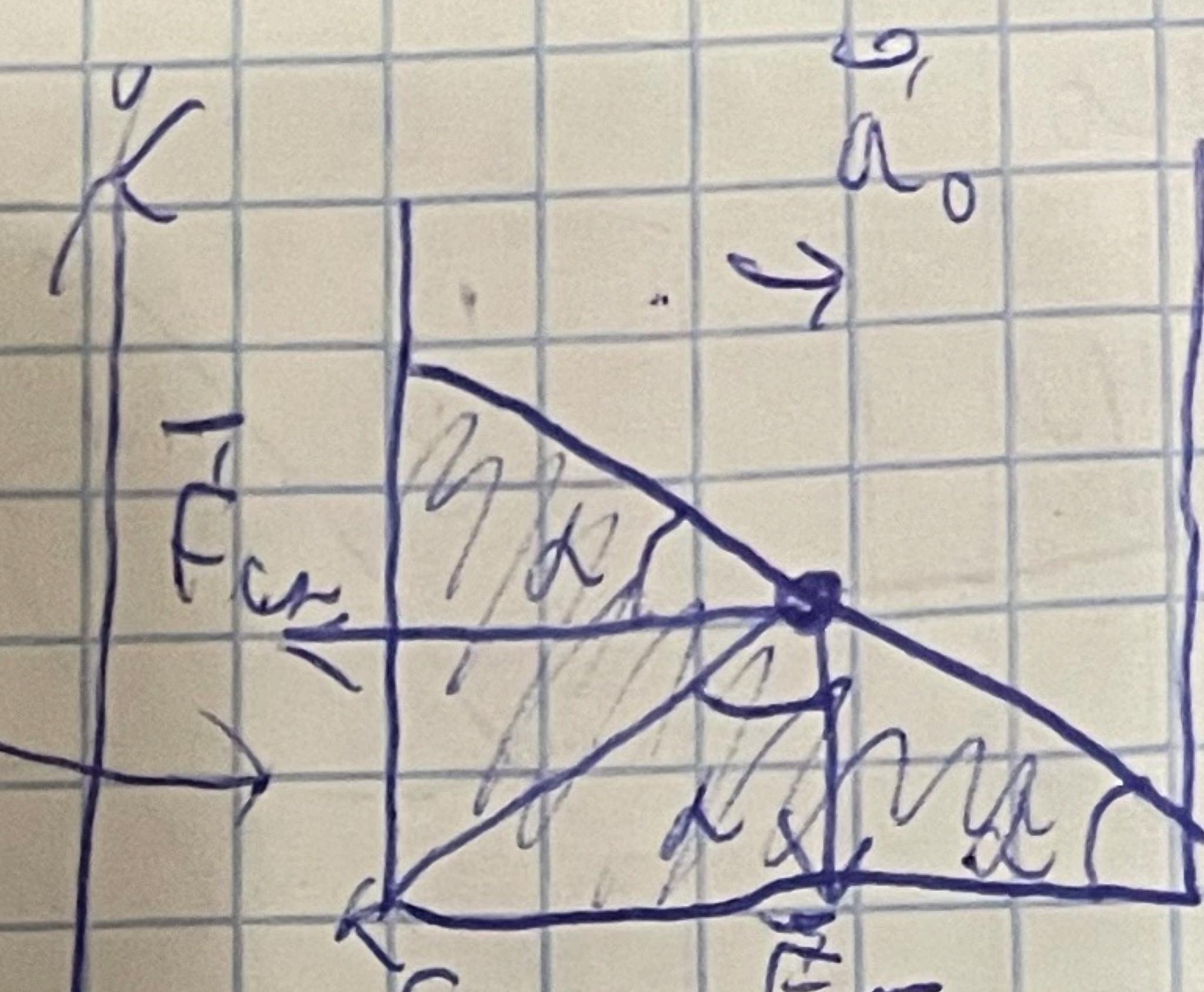
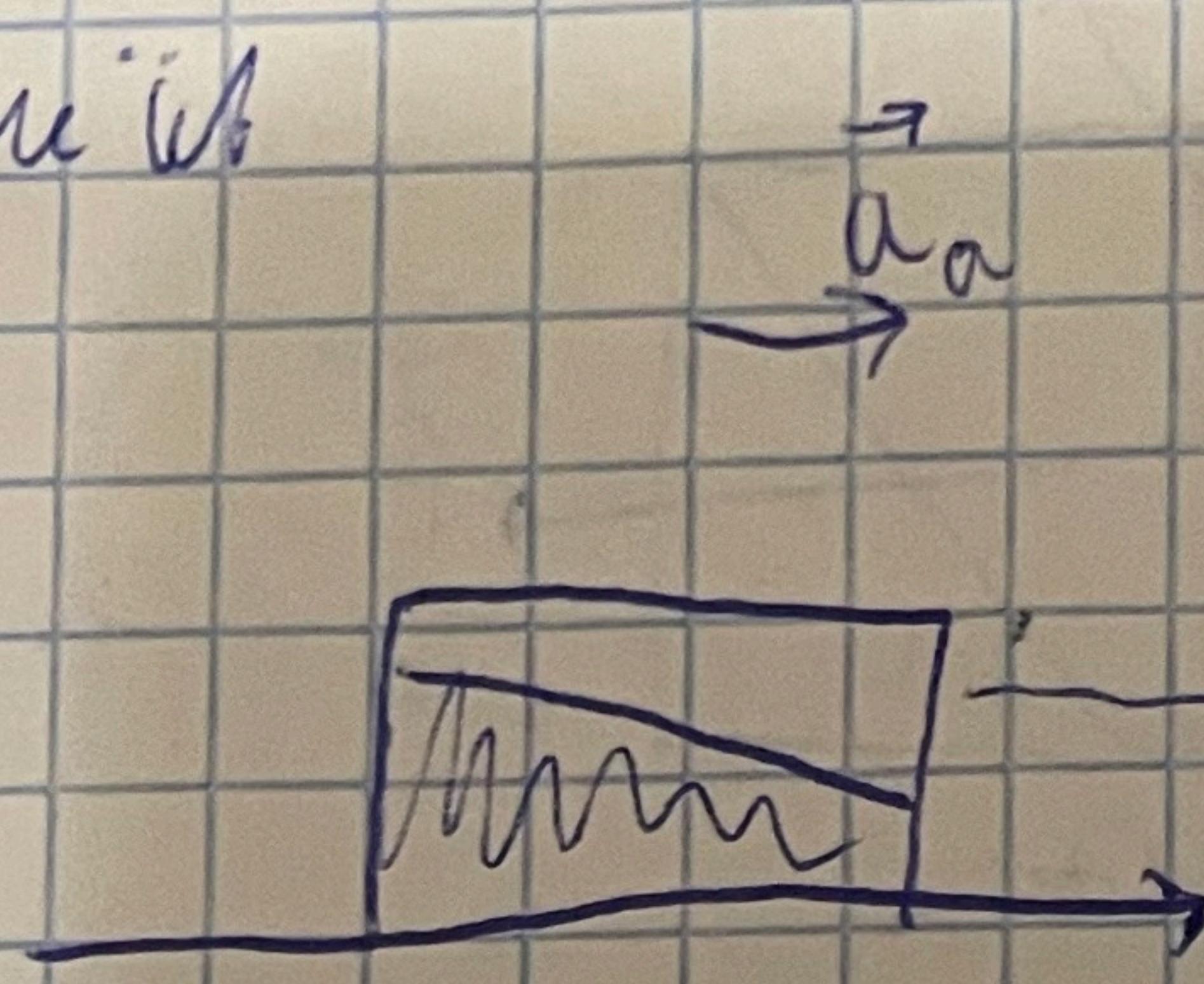
drift

$$\vec{a}_a$$

$$\vec{a} = \gamma \frac{\vec{m}}{c^2}$$

$$g' = 0,8 \frac{m}{c^2}$$

$\lambda - ?$

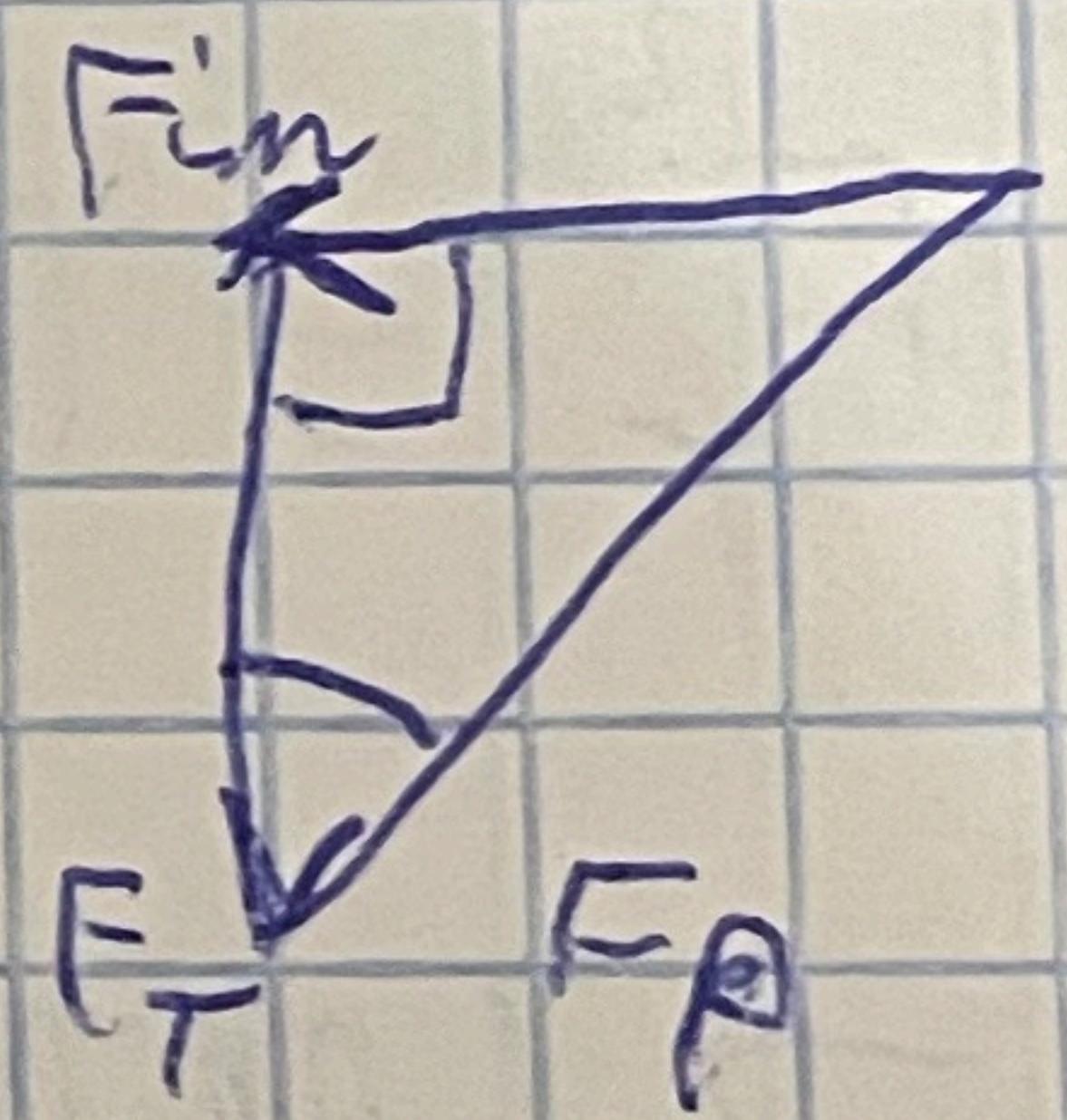


x

Pezzolmyora ista:  $\vec{F} = \vec{F}_{in} + \vec{F}_T \Rightarrow$

$$\Rightarrow \vec{F} = \vec{F}_{in} + \Delta m \vec{g}' = \Delta m [g' - \vec{a}_0]$$

$$\tan(\alpha) = \frac{\vec{F}_{in}}{\vec{F}_T} = \cancel{\text{Analog}} \frac{\Delta m a_0}{\Delta m g'} = \frac{\vec{a}_a}{g'}$$



$$\tan(\alpha) = \frac{\vec{a}_0}{g'} \Rightarrow \alpha = \cancel{\text{arctan}} \left( \frac{a_0}{g'} \right) = 5,83^\circ$$

Bekannt:  $\lambda = 5,83^\circ$

17-55 Orbot

②

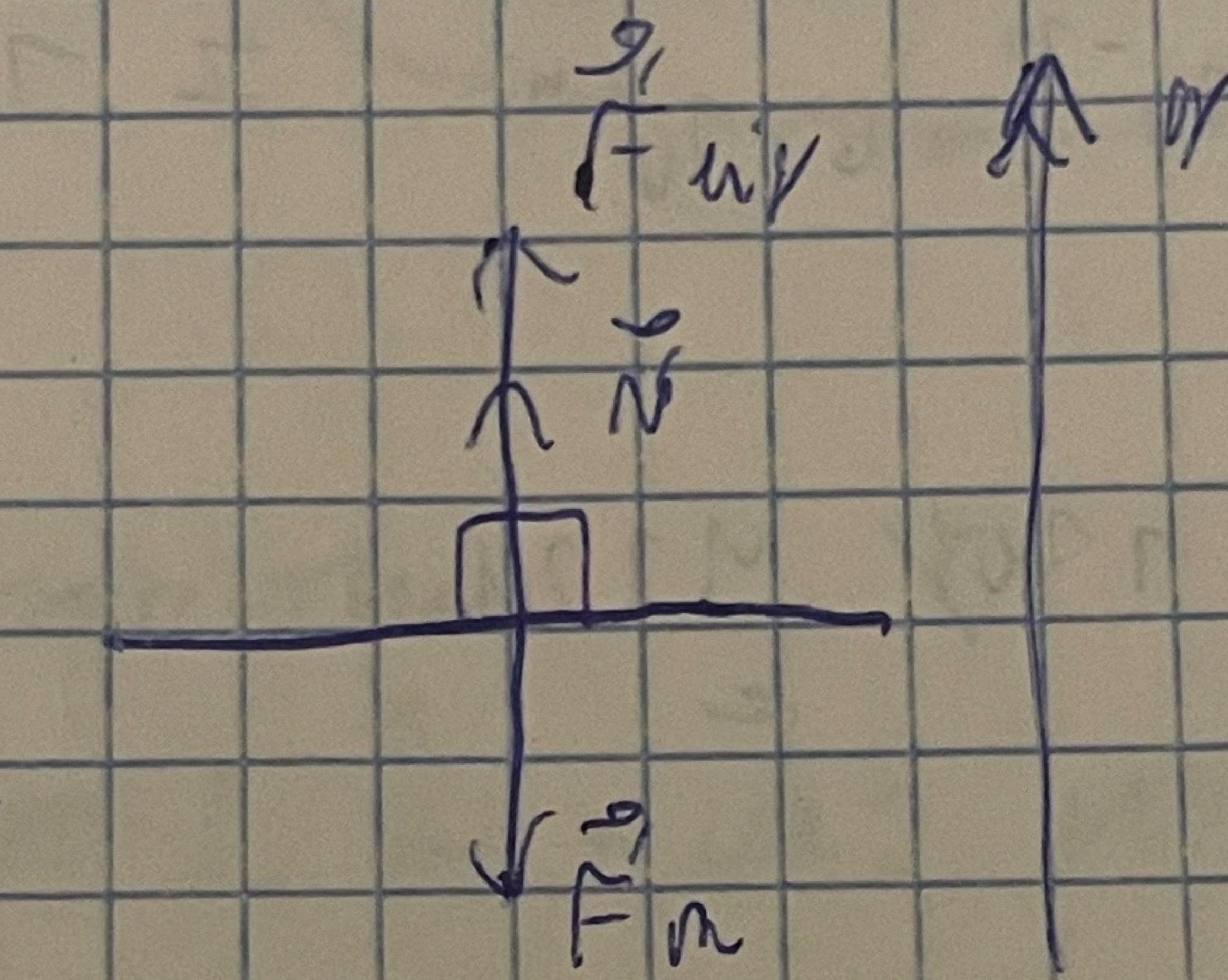
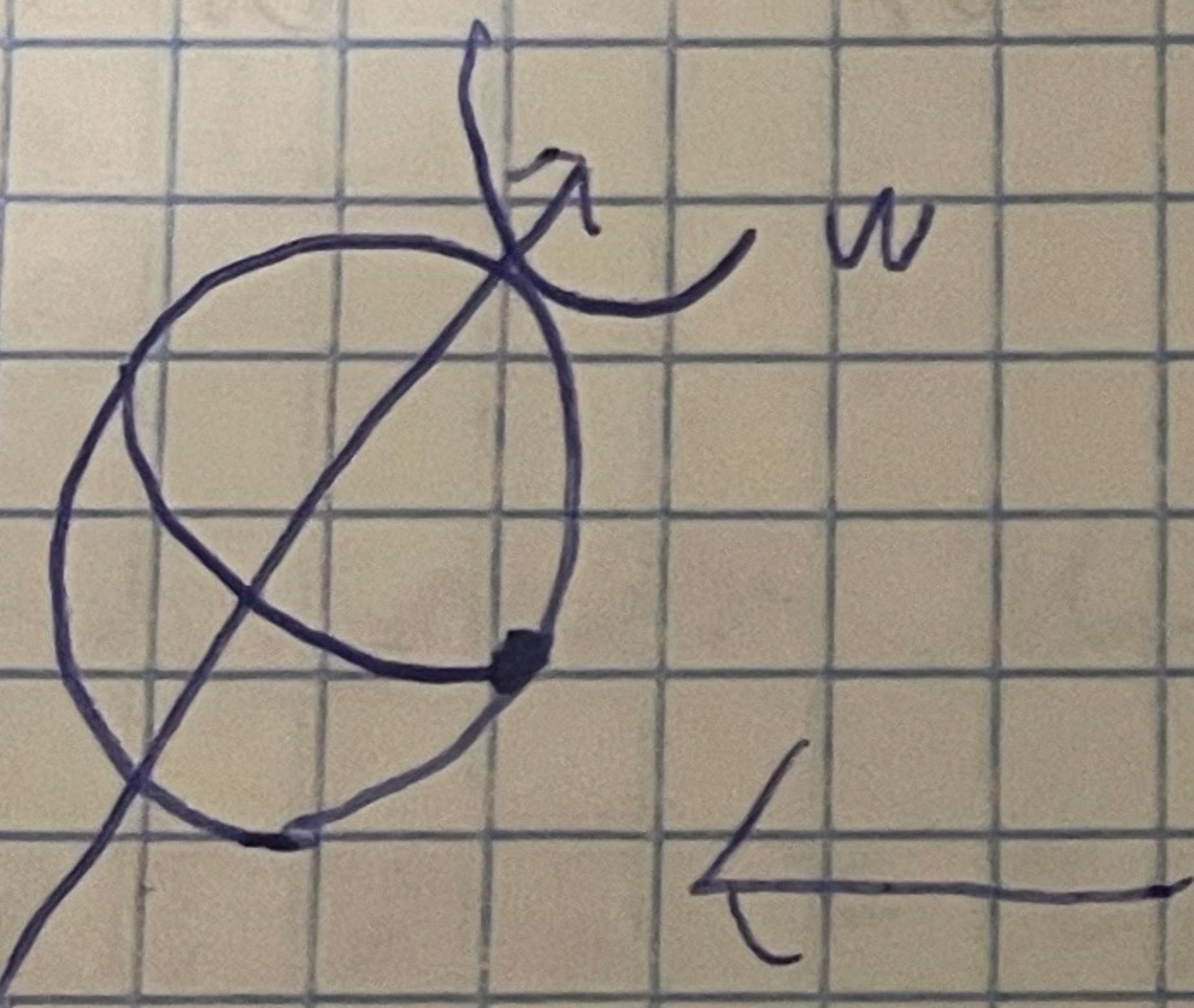
② Danu:

$$M_3 = 6 \cdot 10^{24} \text{ kg}$$

$$R_{3m} = 6380 \text{ km}$$

$$G = 6,67 \cdot 10^{-11} \frac{\text{m}^3}{\text{kg} \cdot \text{s}^2}$$

T - ?



$$\vec{F}_T = G \frac{M_3 \cdot m}{R_3^2}$$

$$\vec{F}_{\text{grav}} = m \omega^2 R_3$$

$$T = \frac{2\pi}{\omega}$$

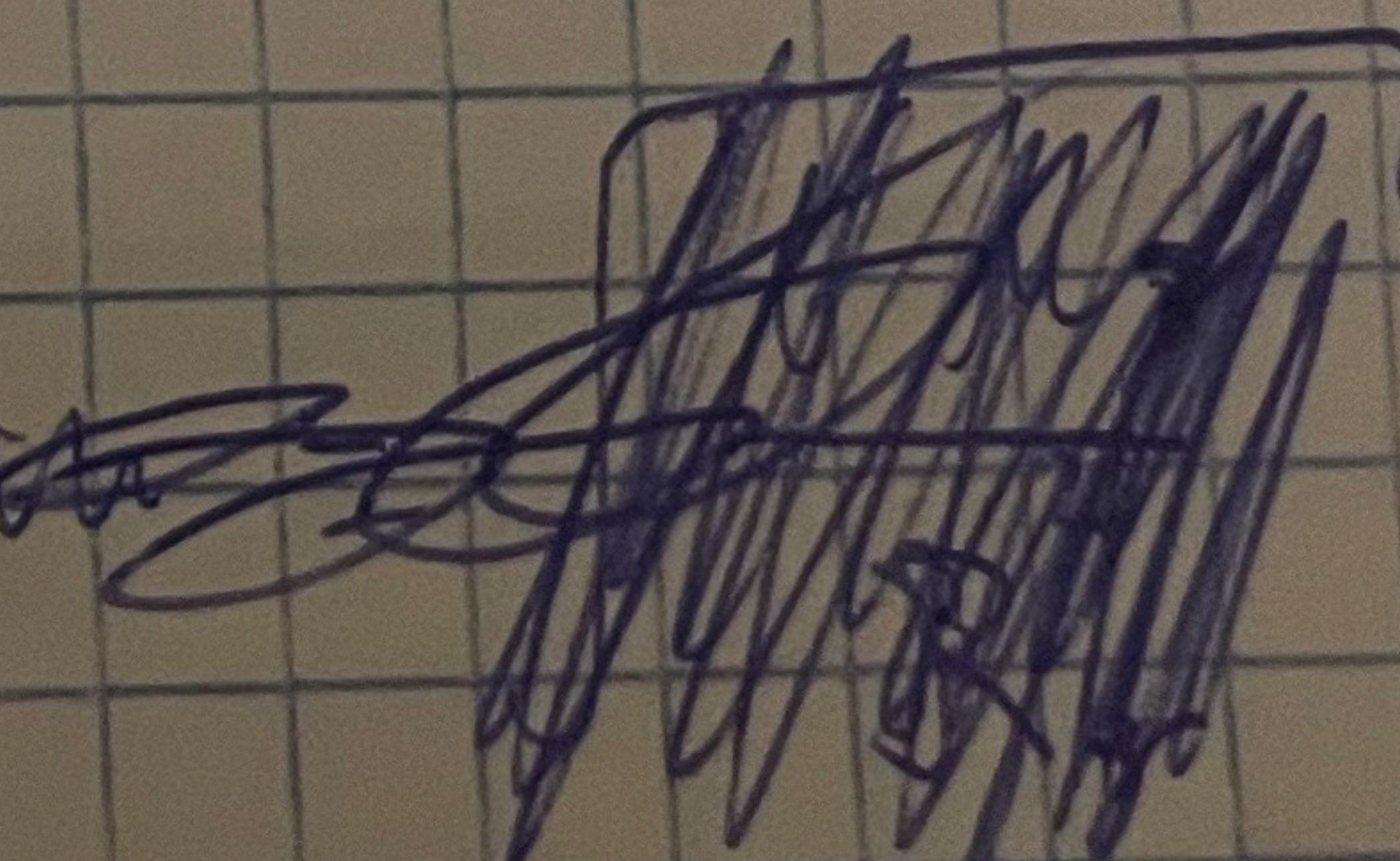
in 9(93)

Neutronium - mimo u git na onopry ma nigril, bora = 0;  $\rho = 0$  ( $N = 0$ ). 2-ā zákon Ohomona:

$$\text{Oz: } \vec{F}_{\text{grav}} + \vec{N} - \vec{F}_T = 0 \Rightarrow - \text{ vibratiau}$$

$$\Rightarrow \vec{F}_{\text{grav}} = \vec{F}_T$$

$$m \omega^2 R_3 = G \cdot \frac{M_3 \cdot m}{R_3^2} \Rightarrow$$



17-45 9mw

③

$$m \omega^2 R_2 = G \frac{M_2 m}{R_2^3} \Rightarrow \omega = \sqrt{\frac{G M_2}{R_2^3}}$$

$$T = \frac{2\pi}{\sqrt{\frac{G M_2}{R_2^3}}} \Rightarrow T = 2\pi \sqrt{\frac{R_2^3}{G M_2}}$$

$$T = 2\pi \sqrt{\frac{0,38 \cdot 10^6}{6,67 \cdot 10^{-11} \cdot 6 \cdot 10^{24}}} = 120\text{ s}$$

Berechnung:  $T = 120\text{ s}$

17-05 knot

③ Dano:

$$T = 2u w \sin \varphi$$

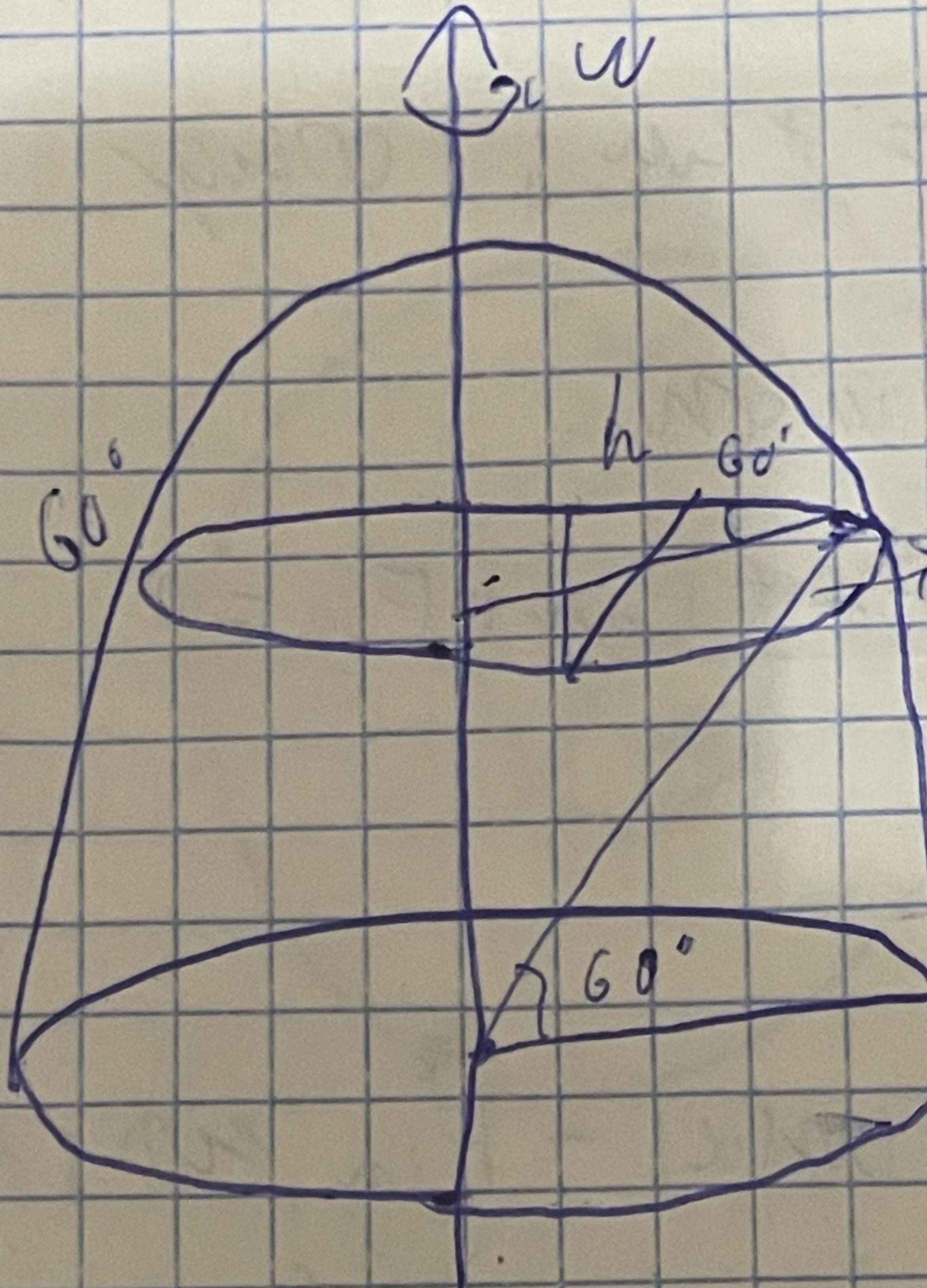
$$\varphi = 60^\circ$$

$$u = 900 \frac{m}{s}$$

$$s = 7,0 \text{ km}$$

$$h - ? \text{ m}$$

Sin?



④

(направлене

у син волни)

$$\vec{F}_r = m u [\vec{u} \times \vec{w}]$$

2-й закон Ньютона:

$$Ox: \vec{m} \vec{a} = 2m [\vec{u} \times \vec{w}] \sin \varphi$$

$$\Rightarrow \vec{a} = 2 [\vec{u} \times \vec{w}] \sin \varphi$$

$$h = \frac{\vec{a} t^2}{2} \quad ; \quad t = \frac{s}{u} \quad ; \quad w = \frac{2\pi}{T}$$

$$h = \frac{[\vec{u} \times \vec{w}] \times m \sin(\varphi) \cdot \left(\frac{s}{u}\right)^2}{2} = \frac{\vec{u} \sin(\varphi) s^2}{u} \Rightarrow$$

$$\Rightarrow h = \frac{\frac{2\pi}{T} \sin(\varphi) s^2}{u} = \frac{2\pi s^2 \sin(\varphi)}{u T}$$

$$h = \frac{2\pi (17000)^2 \cdot \sin(60^\circ)}{900 \cdot 2 \pi \cdot 3600} \approx 0,069 \approx 0,07 \text{ m}$$

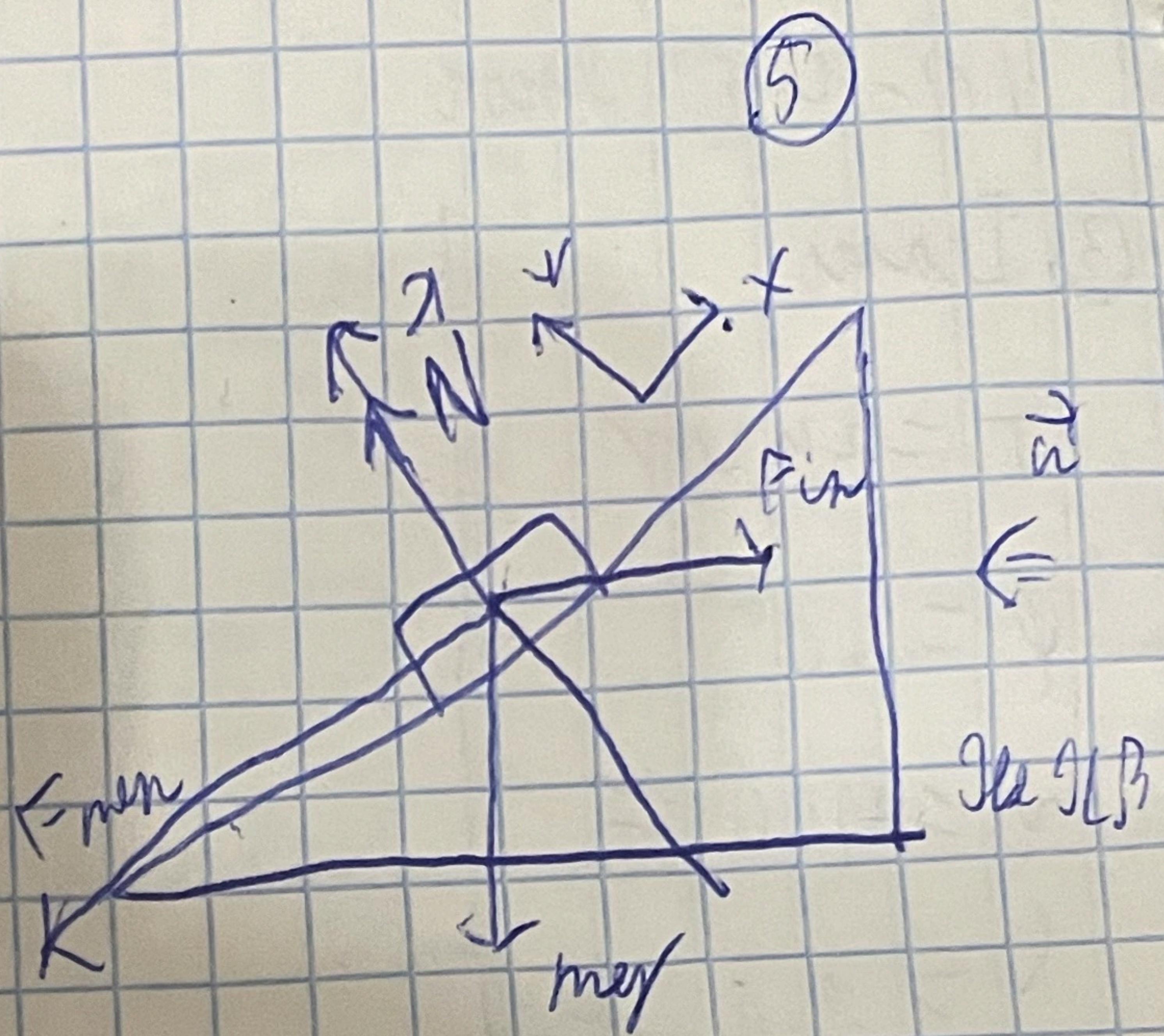
Inus gnot

*Sinnotia*:  $n = \alpha m$ , strong

④ Dan: | ~~está~~ <sup>en</sup> Yukon.

A free body diagram of a block on an incline. The block is labeled  $m$ . A horizontal line extends from the right side of the block, representing the normal force  $N$ . A vertical line extends downwards from the center of the block, representing the weight  $w$ . A dashed line extends parallel to the incline upwards from the center of the block, representing the component of weight parallel to the incline, labeled  $w \sin \theta$ .

$$N + F_T + F_{\text{mer}} + F_{\text{iz}} = 0$$



OY: W - F<sub>y</sub> curvad - F<sub>in</sub> sinial  $\Rightarrow$

$\Rightarrow \vec{N} = \text{máj cos}(a) + \text{máj sin}(a)$

$$ux_1 - \mu N - my_1 \sin(\alpha) + m u y_1 \cos(\alpha) = 0$$

$$-\mu_1 m_0^2 \cos(\alpha) - m_0^2 \sin(\alpha) + m_0^2 \tan(\alpha)$$

$$= 0 \quad t$$

$$-\mu m_g \omega_{\text{rad}} - m \omega_{\text{min}}^2 (d + m_a' \cos \theta) = 0$$

$\text{max}_i \omega_i(d) - \min_i \omega_i(d) = \overline{\omega}(d)$

o um cor da + nim da

(7-95) anot

(6)

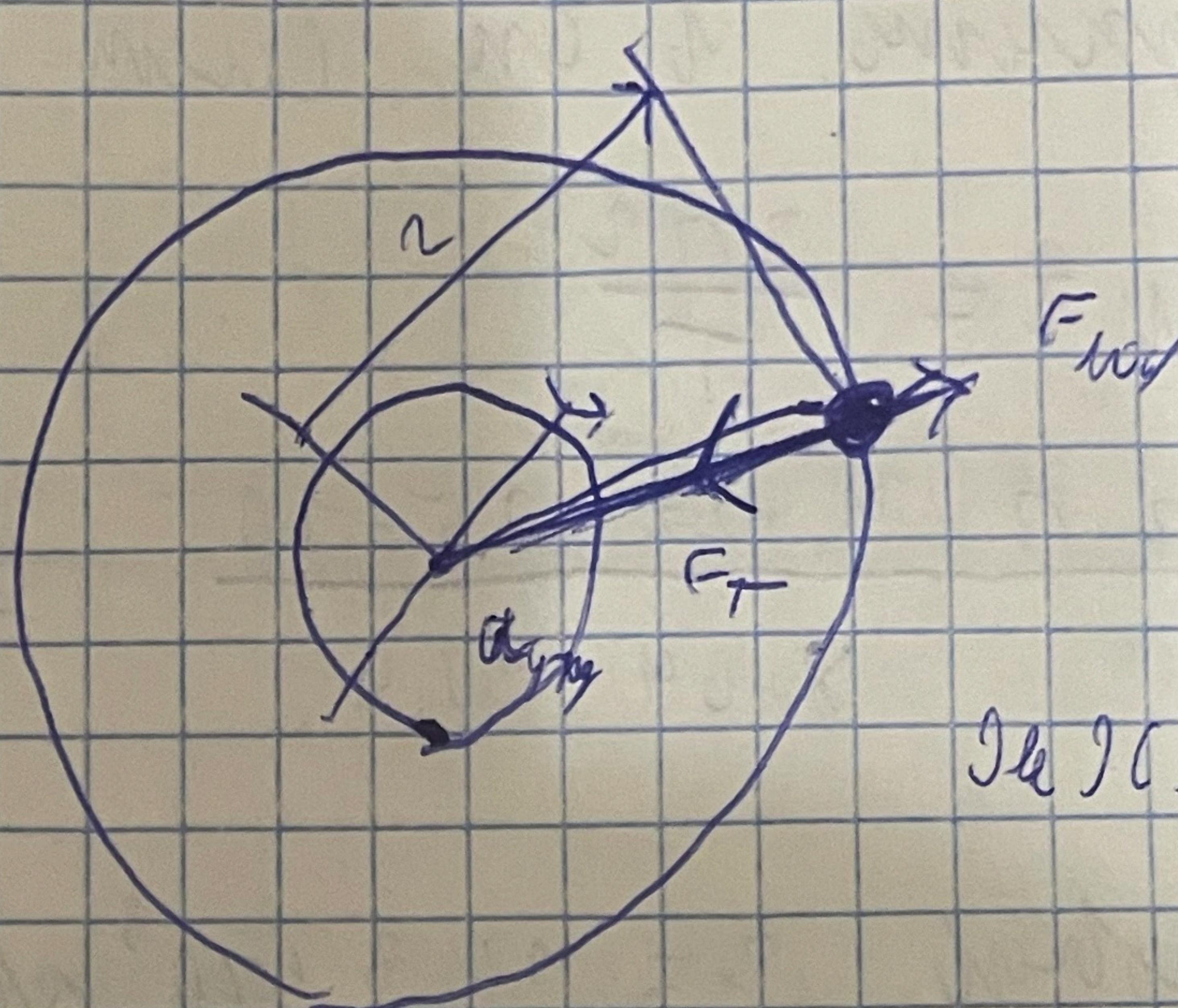
⑥ Dano:

$$M_3 = 6 \cdot 10^{24} \text{ kg}$$

$$T = 24 \text{ hours} = 8,64 \cdot 10^4 \text{ s}$$

$$G = 6,67 \cdot 10^{-11} \frac{\text{N} \cdot \text{m}^2}{\text{kg} \cdot \text{s}^2}$$

z - ?



Ile JCB ma GLB

Супутник з масою  $m$  на розміженні  $r$  отримує оптимальні

масові криволінійні відгуки від супутника = Криволінійні відгуки

$$w_1 = w_2 = w$$

Оптимальний радіус  $r$

$$\vec{F}_T = G \frac{m M_3}{r^2}$$

$$w = \frac{2\pi}{T}$$

$$\vec{F}_{\text{tang}} = m w^2 \vec{r}$$

$$\vec{F}_{\text{tang}} = \vec{F}_T \Rightarrow m w^2 \vec{r} = G \frac{m M_3}{r^2} \Rightarrow$$

$$= r = \sqrt[3]{\frac{G M_3}{m^2}} \Rightarrow r = \sqrt[3]{\frac{G M_3 T^2}{4\pi^2}}$$

$$r = \sqrt[3]{\frac{G \cdot 10^{24} \cdot 6,67 \cdot 10^{-11}}{m M^2} \cdot (3,64 \cdot 10^4)^2} = 423 \cdot 10^3 \text{ km}$$

6.7 - 45 min

②

Wirkungsmaß, b) in. Einw. fior

$$V = v \cdot z = \frac{3\pi^2}{T}$$

$$V = \frac{2\pi \cdot 4,22975 \cdot 10^2}{8,69 \cdot 10^4} \approx 3,076 \cdot 10^3 \frac{\text{m}}{\text{s}}$$

Berechnung:  $z = 42,3 \cdot 10^3 \text{ m} \cdot v = 3,09 \frac{\text{km}}{\text{s}}$