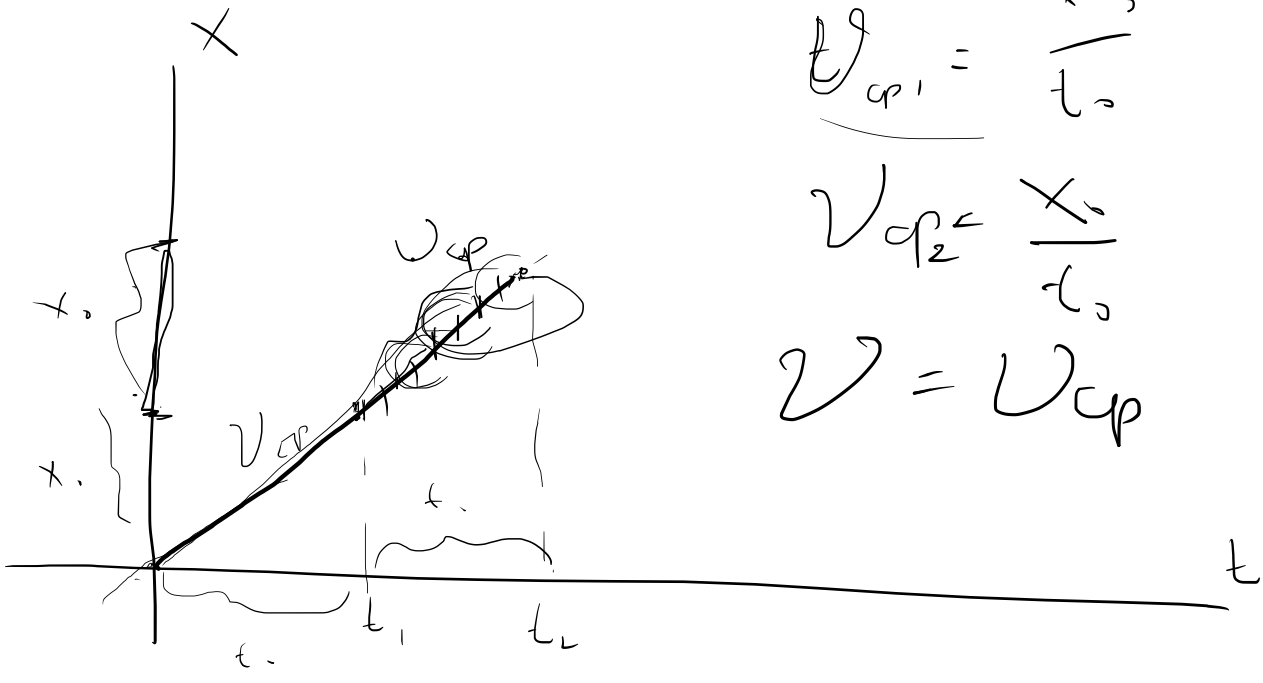
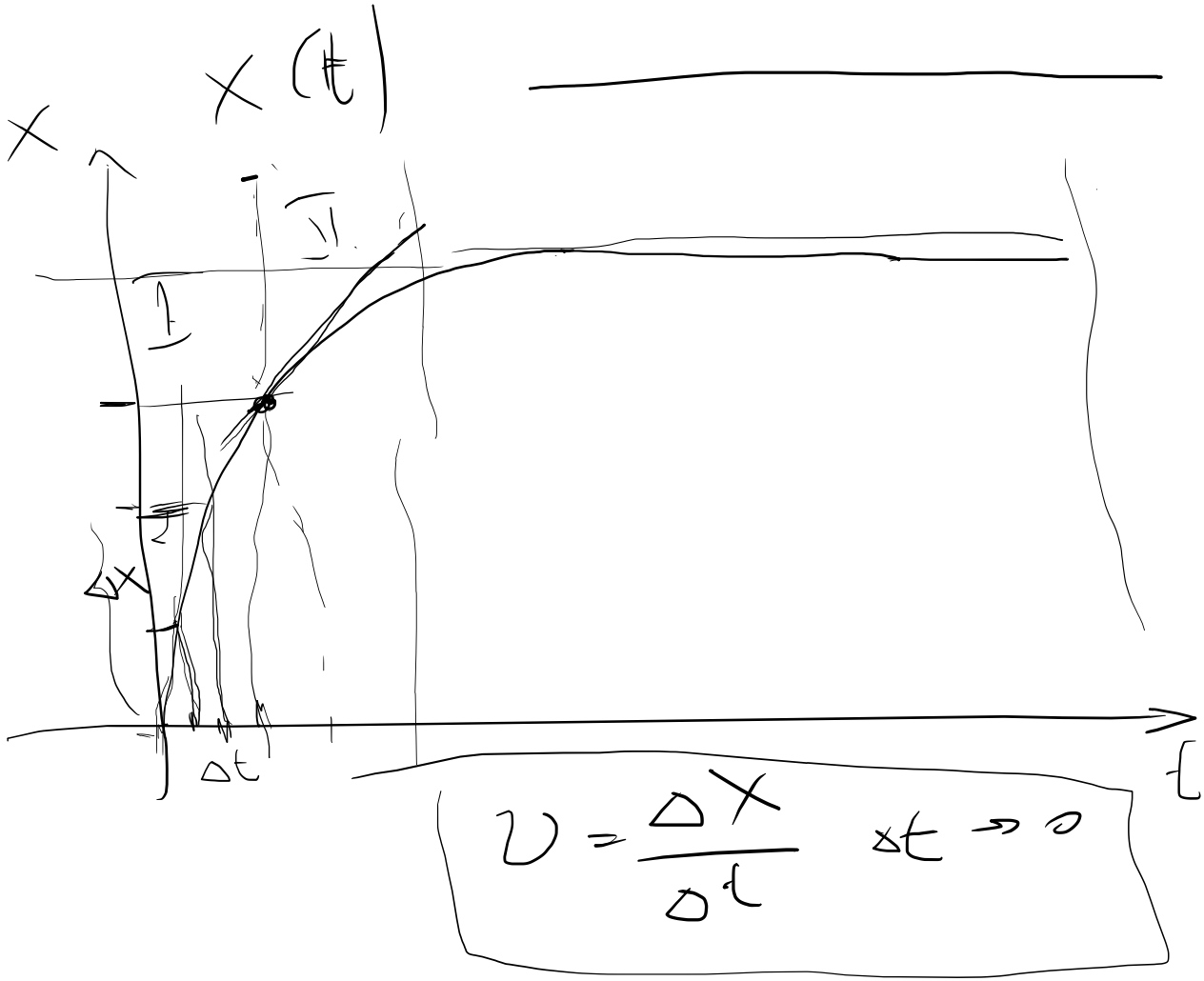
$$v_{cp} = \frac{S_{ice}}{t_{bce}} \qquad v = \text{———}$$



$$v_{cp_1} = \frac{x_0}{t_0}$$

$$v_{cp_2} = \frac{x_0}{t_0}$$

$$v = v_{cp}$$



$$v = \frac{\Delta x}{\Delta t} \quad \Delta t \to 0$$

$$\frac{\Delta x}{\Delta t} = v \;\Big|\; \Delta t \to 0 ;$$

$$\frac{dx}{dt} = v = \dot{x}$$

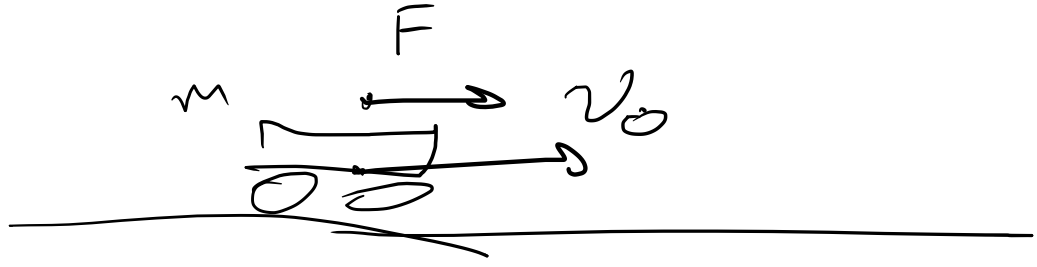
$$\frac{d\bar{r}}{dt} = \vec{v}$$

$v(t)$

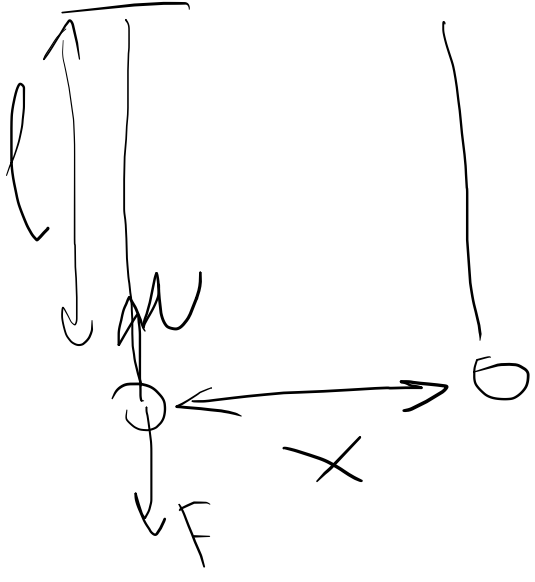
$F \sim a$

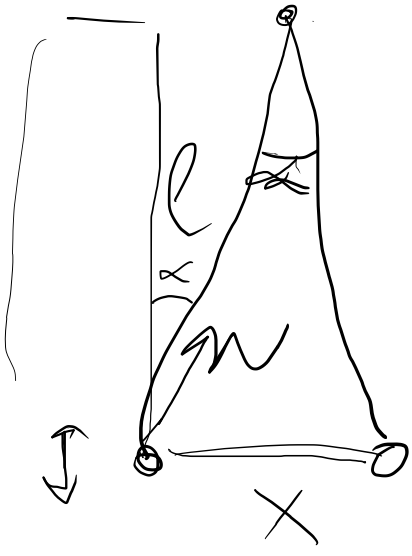
v

$(v(+))$



$$v = v_0 + at = v_0 + \frac{F}{m} t$$


l
x
F


l
x

y cu.

$x << 1$ $\quad tgx = \frac{\sin x}{\cos x} =$

$\sin x \approx x \approx \frac{x}{1} = x$

$\sin x^2 \approx x^2$

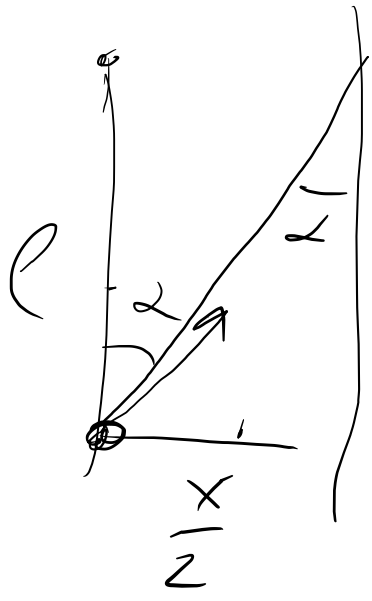
$tgx = x$

$$x << 1,$$

$$\zeta_0 \, x \simeq 1$$

$$\text{Es } \alpha = \frac{x}{2\ell}$$

$$\frac{x}{2\ell} \simeq \alpha \sin\alpha$$

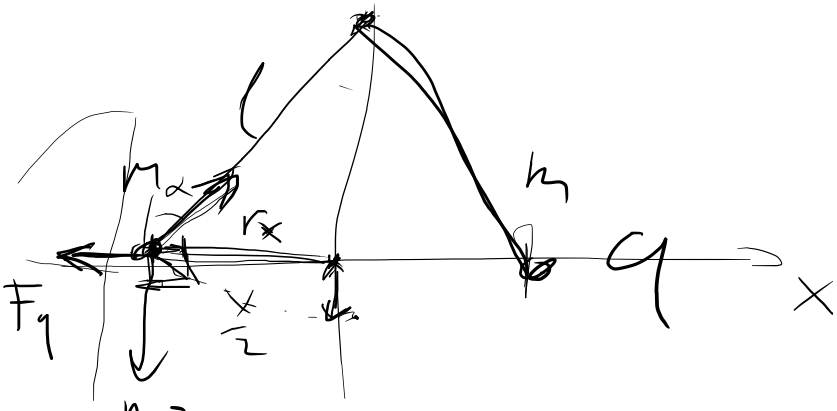


$x << l$

$\bar{F} = m\bar{a}$

$\vec{v} = \bar{a}t$

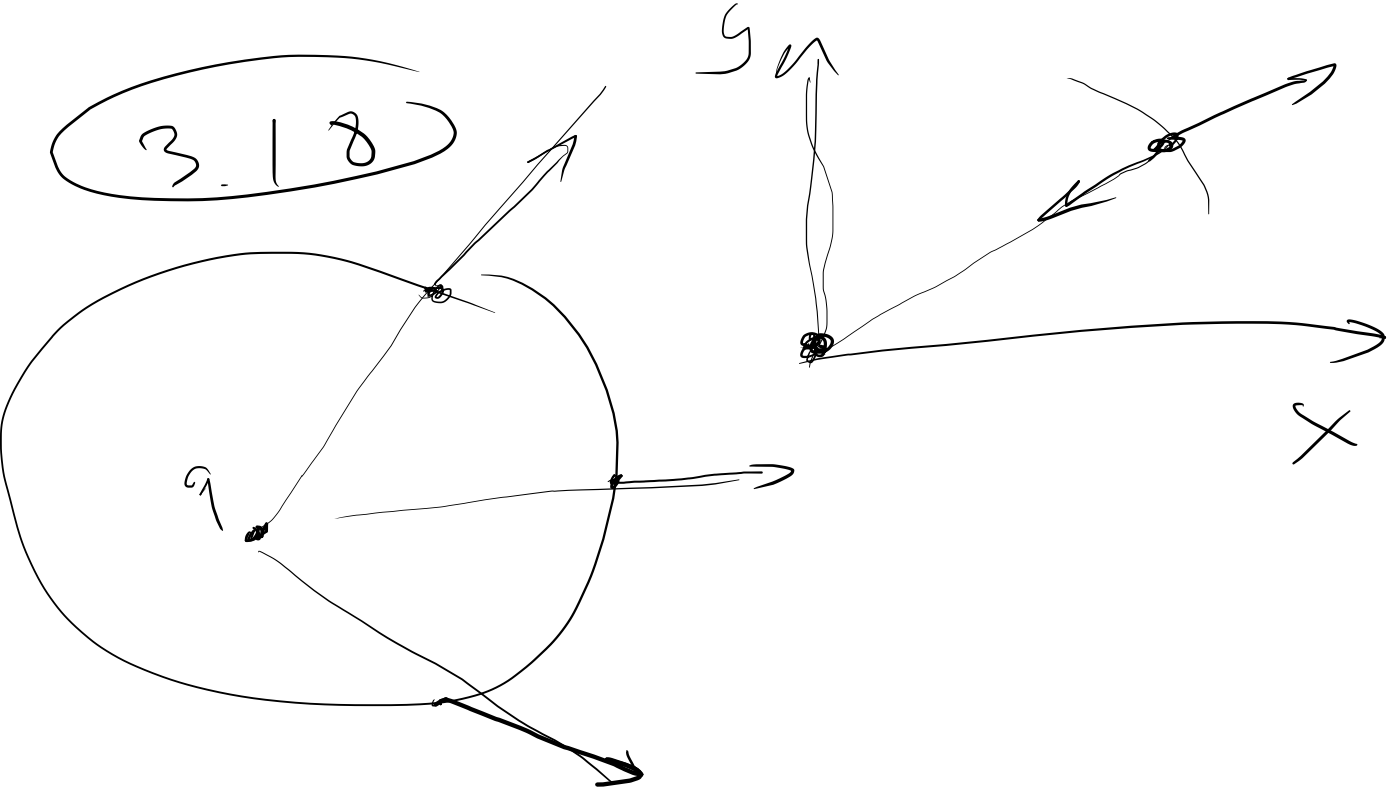
$$\boxed{\vec{v} = \frac{\vec{F}}{m}t}$$

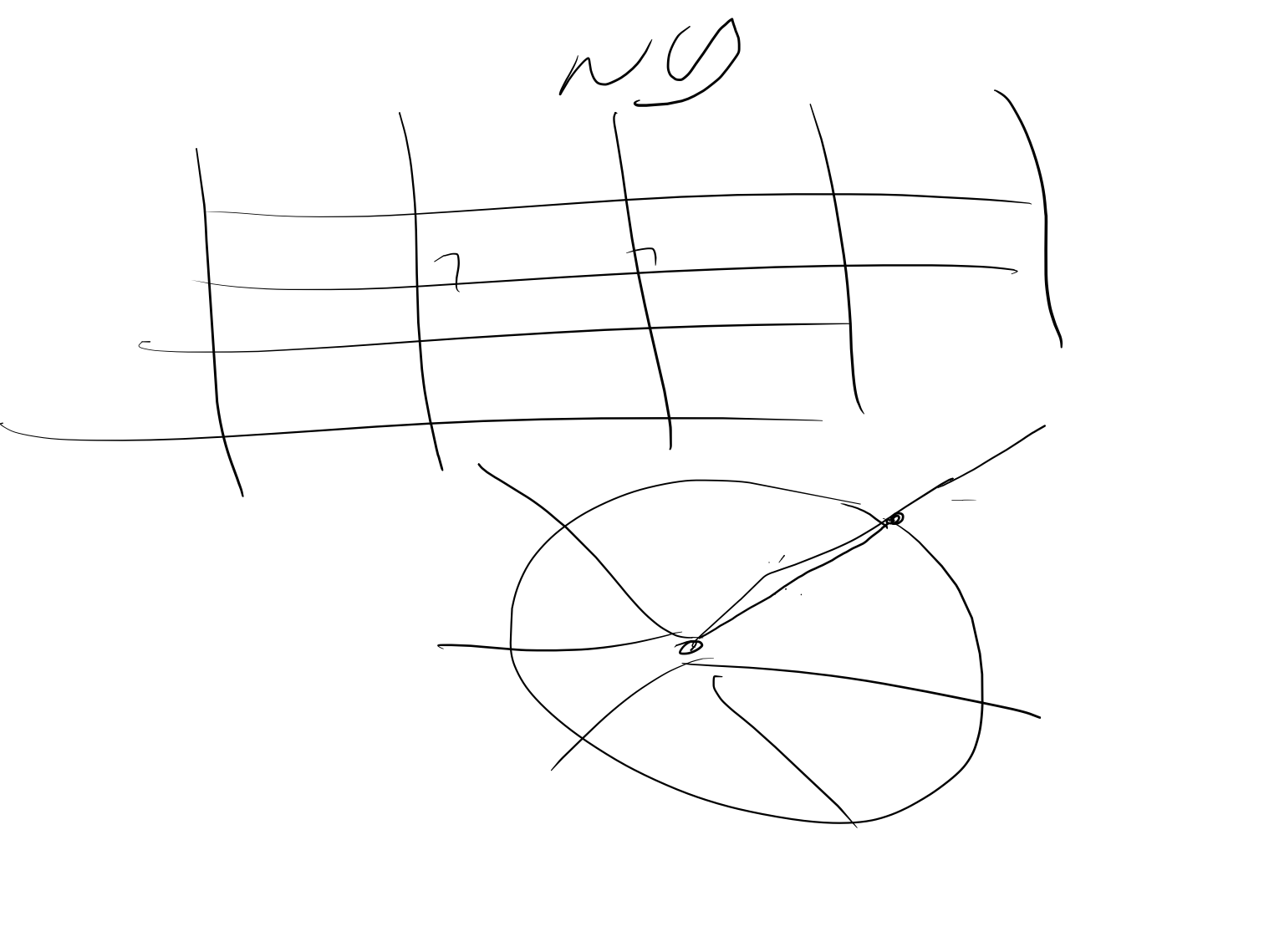


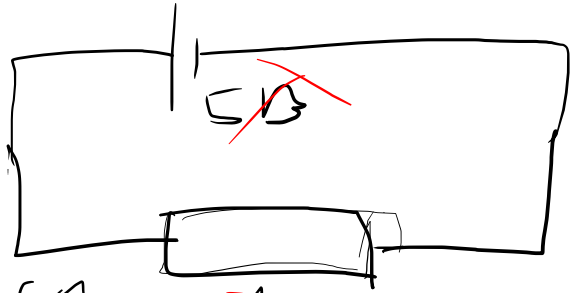
$\bar{F} = \bar{F}_\varepsilon \longrightarrow v$

$$\bar{F}_q = \frac{kq^2}{x^2} = \frac{k(q(t))^2}{x^2}$$

3.18



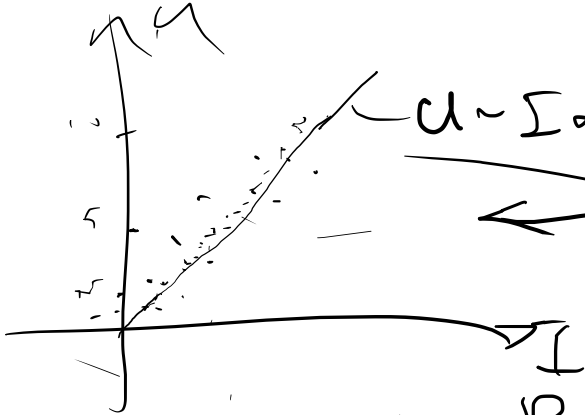




$I = I(U)$

Эксп

Теор.



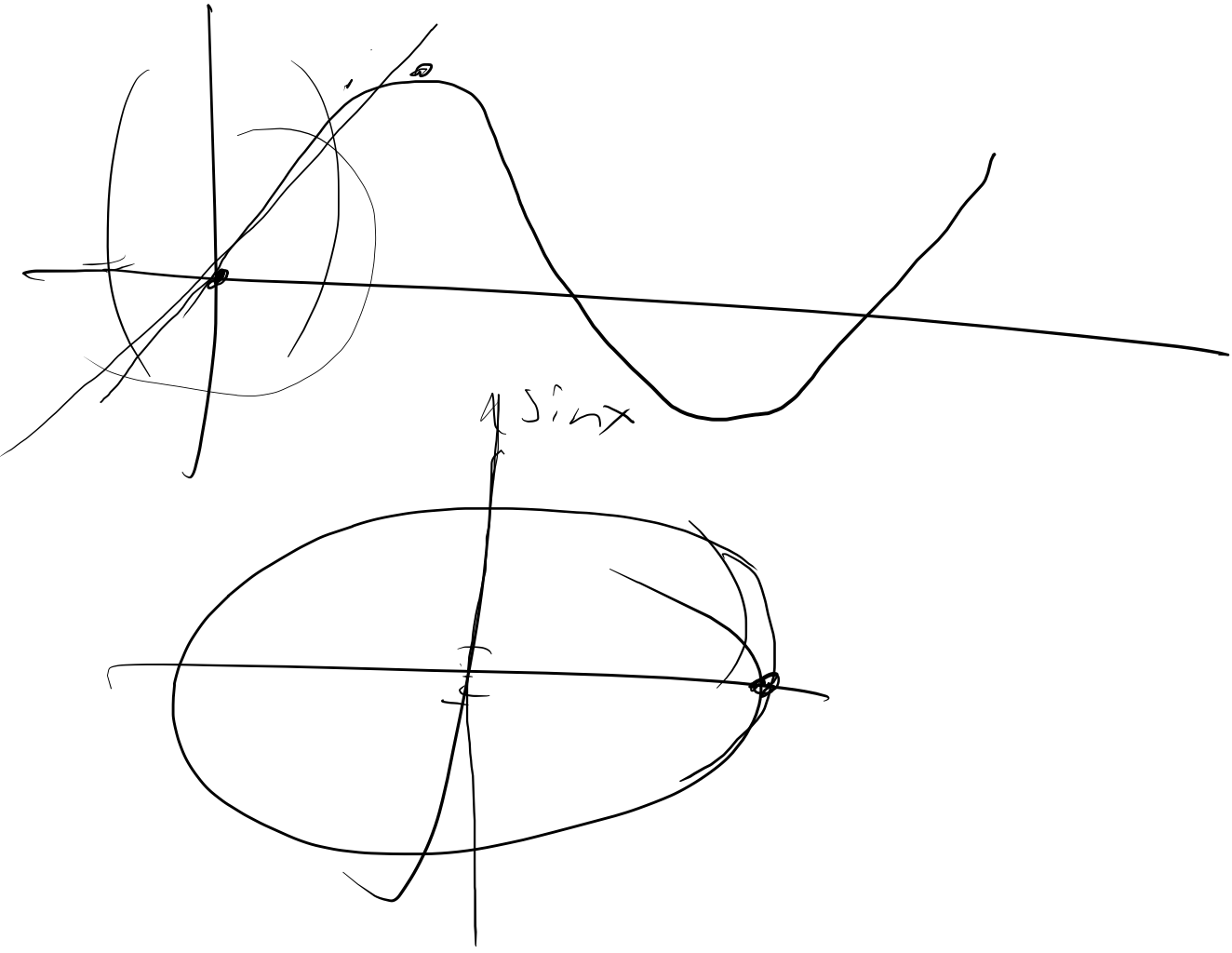
$U \sim I\alpha + O(T)$

$\alpha = R$

R

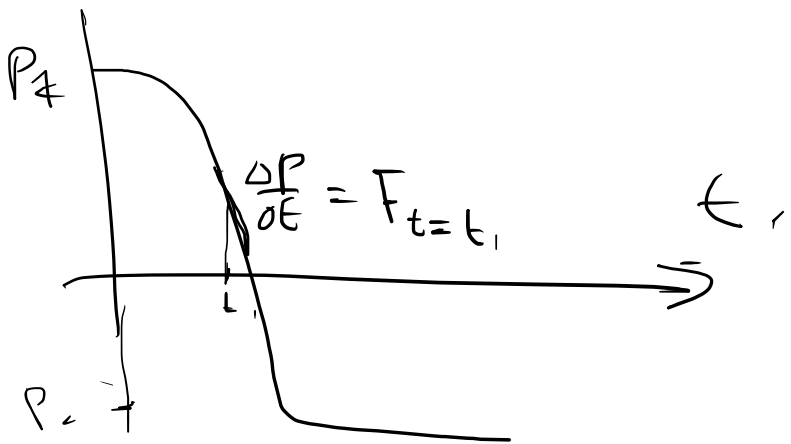
$U = IR$

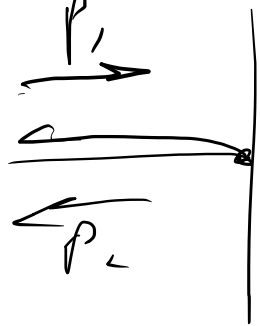
Инвест.


sinx

$$\frac{dx}{dt} = v \qquad \frac{dv}{dt} = a$$

$$\frac{da}{dt} = \dot{a} \qquad \frac{dp}{dt} = F$$

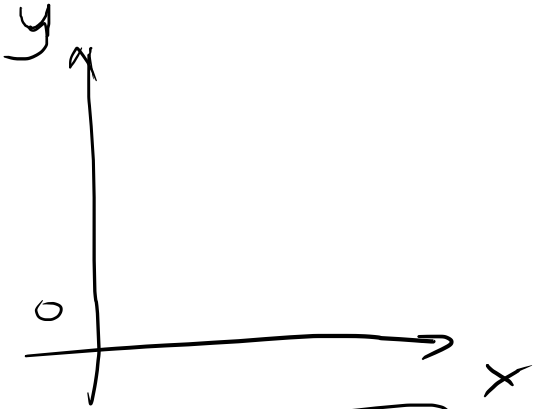




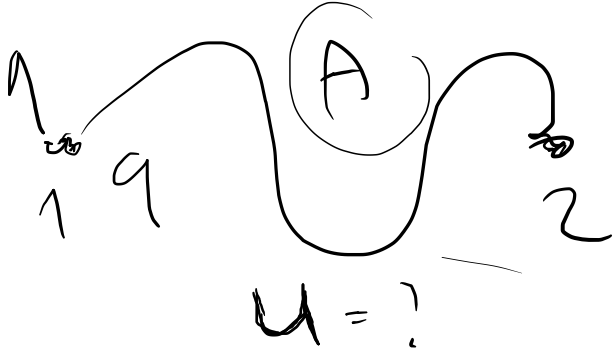
3.18 (2)

$$\boxed{\vec{E} = \frac{\vec{F}}{q}}$$

$F = \bar{E} q$

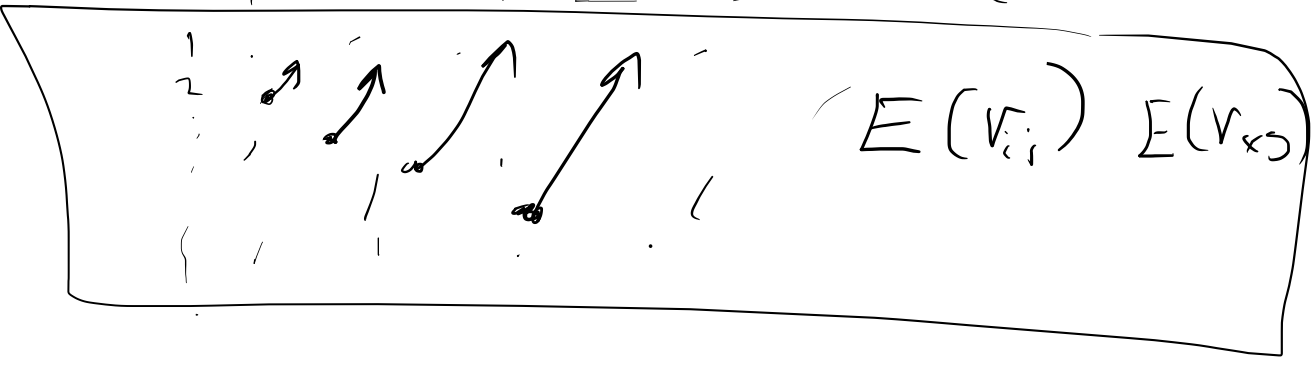


$$\boxed{U = \frac{A}{q}}\ !$$



$$U = \frac{A}{q} \quad \rightsquigarrow \quad \vec{E} = \frac{F}{q}$$

$U(E)$ ~~A, F~~



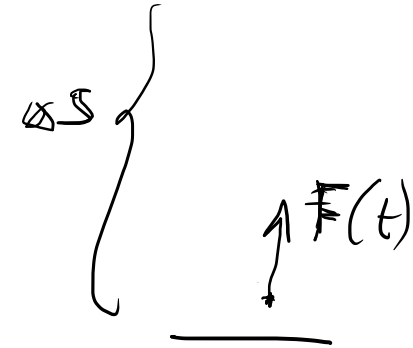
$$E = \frac{kQ}{x^2}$$

$$E_1 = \frac{kQ}{1} \qquad E_2 = \frac{kQ}{2}$$

$$U = \frac{A}{q}$$

$$A = F \cdot S$$

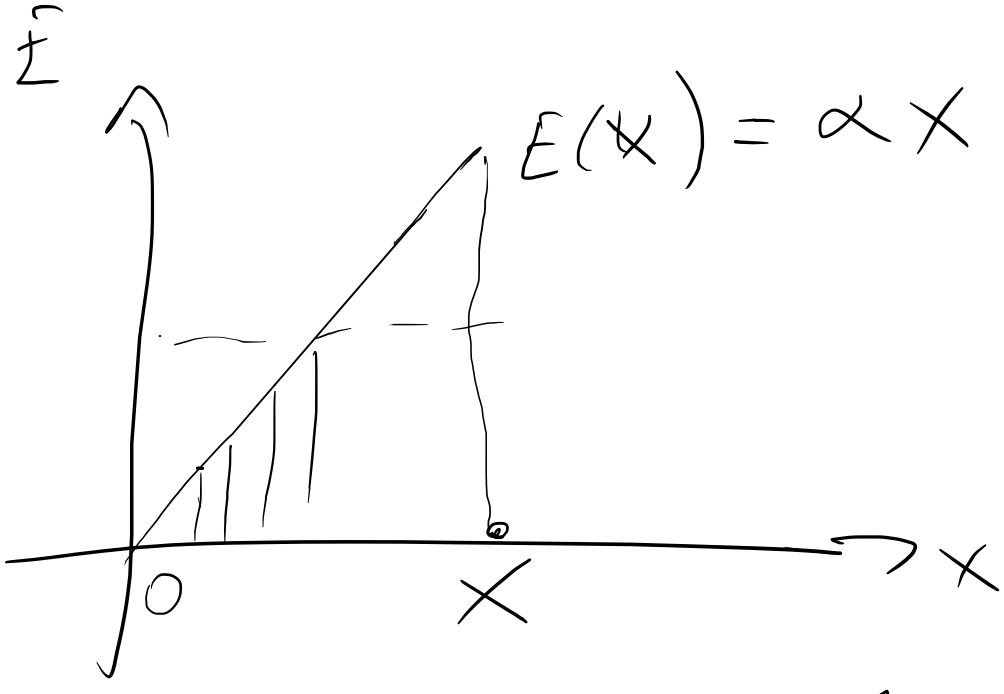
$$A = \left(\vec{F} \cdot \Delta\vec{S}\right)$$



$$A = \left(\vec{F} \cdot \Delta\vec{S}\right) =$$

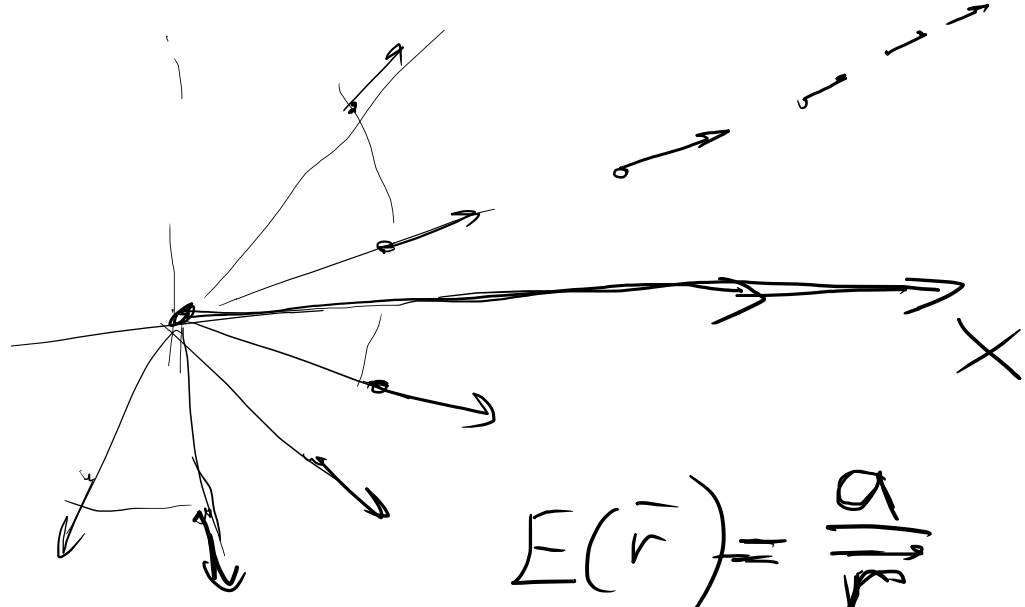
$$A = (\vec{F} \cdot \Delta \vec{S})$$

$$U = \frac{A}{q} = \frac{(\vec{F} \cdot \Delta \vec{S})}{q} = (\vec{E} \cdot \Delta \vec{S})$$

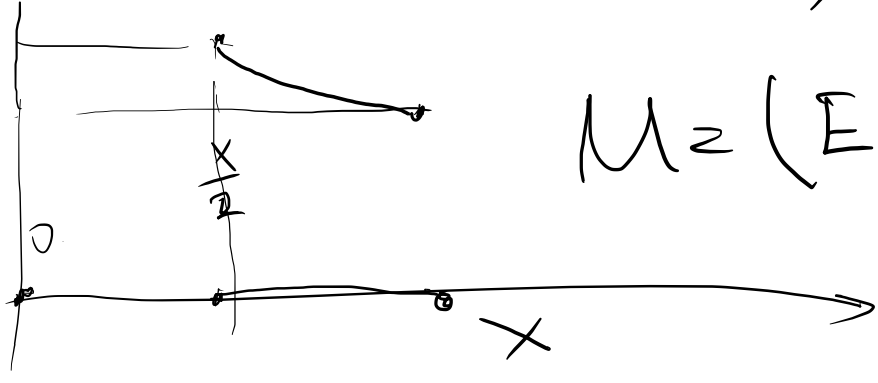


$$\sum \alpha X_i \cdot X = \underline{\alpha X^2}$$

$$= \alpha X \sum X_i = 2X \cdot \frac{X}{2} = \alpha \frac{X^2}{2}$$



$$E(\bar{r}) = \frac{q}{r}$$

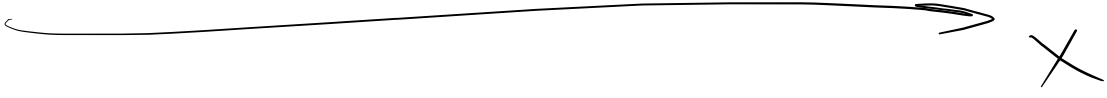


$$U = (E \cdot \Delta x)$$

$$U_i = E_i \cdot \Delta x$$

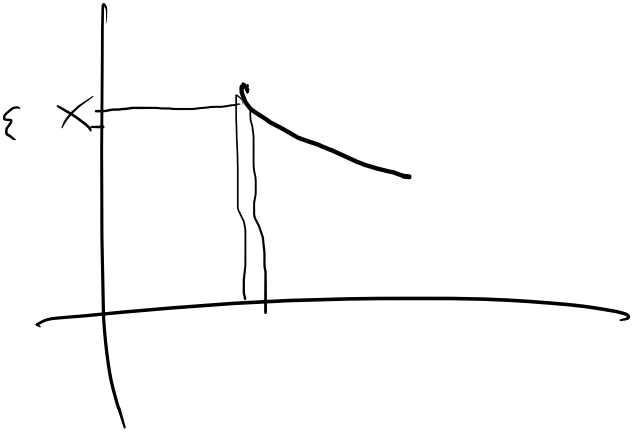
$$U = \sum U_i = \int (E_i \, dx) =$$

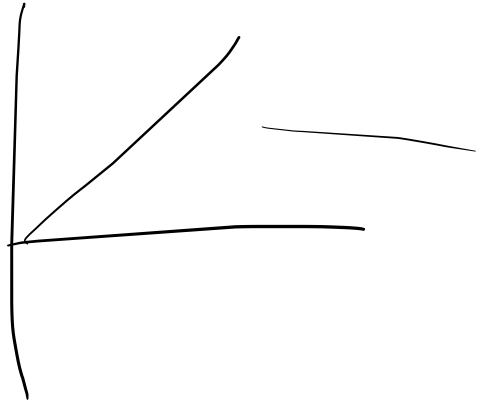
$$= \int \frac{a}{x} dx = a \int \frac{1}{x} dx$$

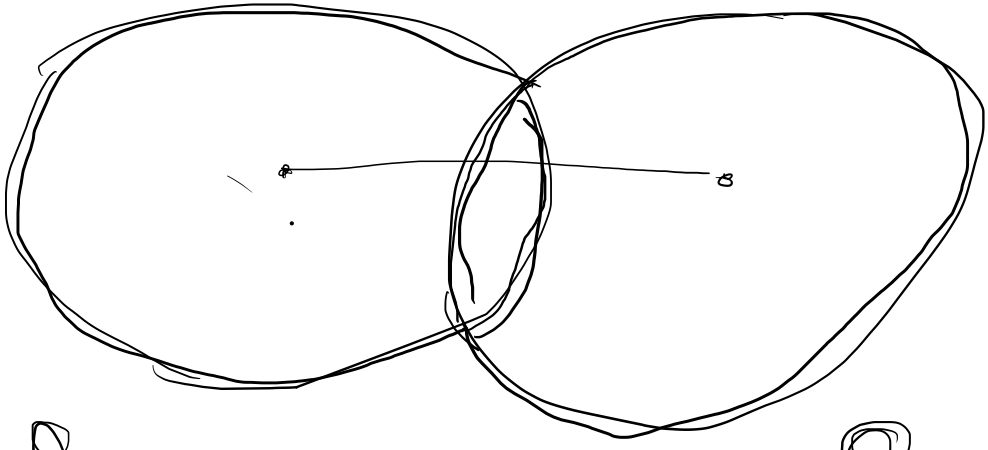


$$a \sum \frac{x_i}{X}$$

$\forall i \in X$







ρ — ρ

$\rho = \frac{m}{V}$ $\rho = \frac{q}{V}$

$U = \frac{A}{q} \rightarrow A = Uq$

$F_g(h) = g \cdot m$

$F_q = -\frac{kQq}{(h-x)^2}$

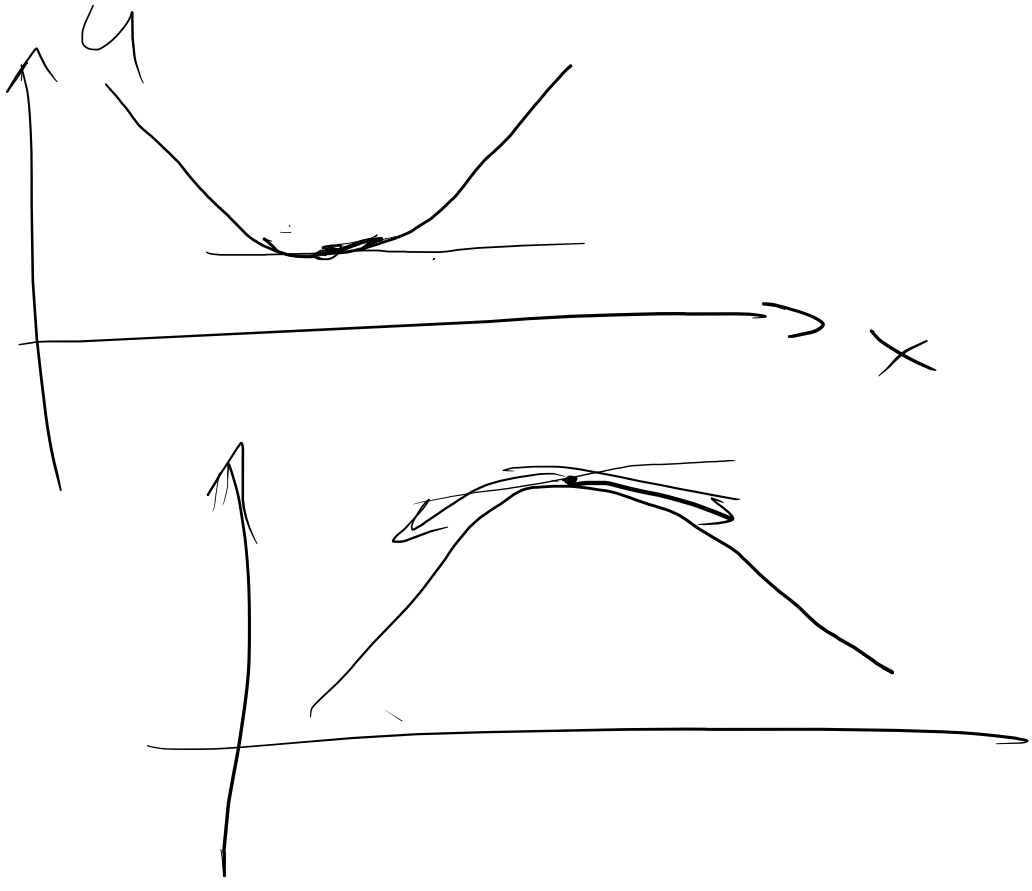
$\Pi_g = mgh$

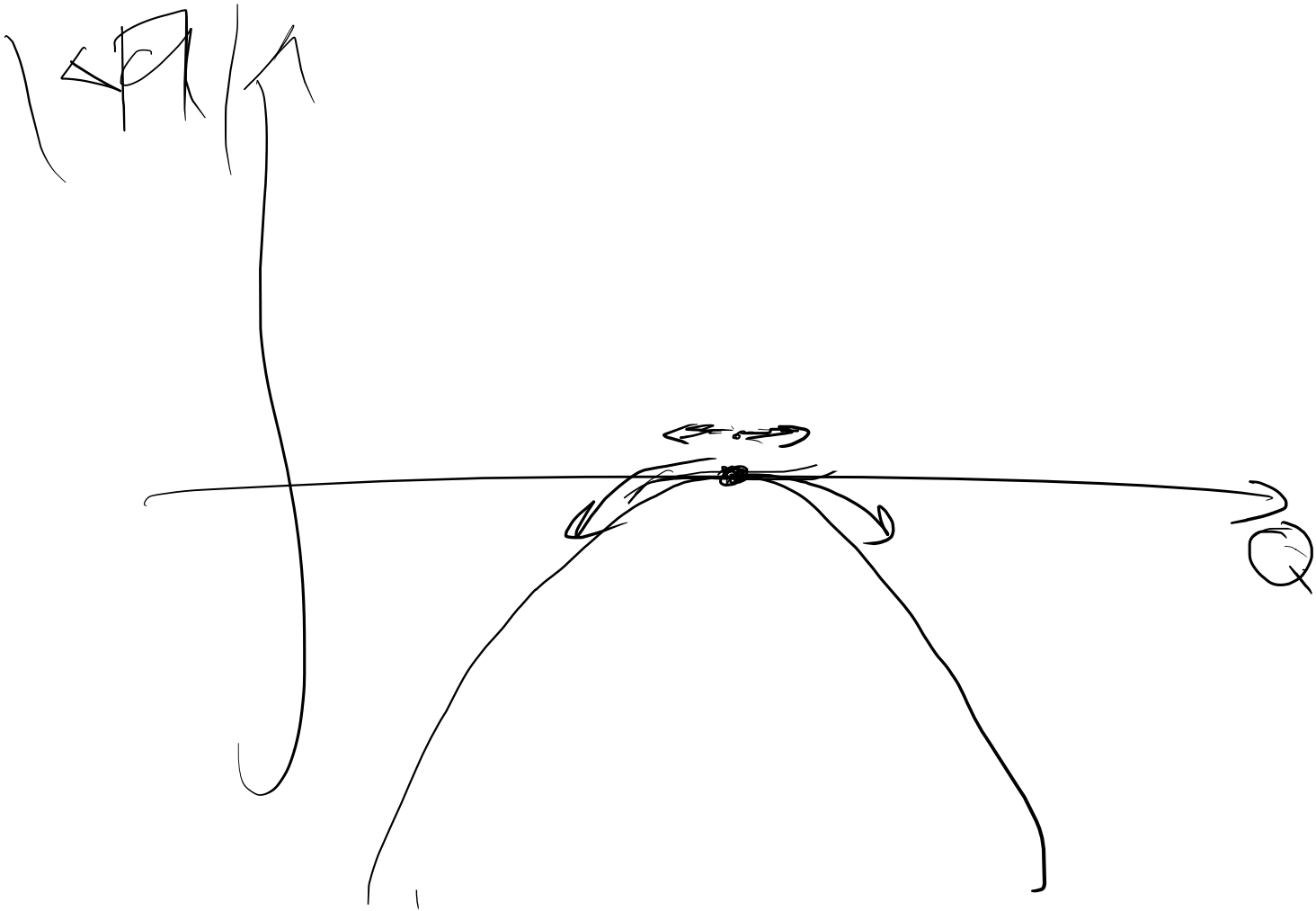
Q

$F = mg - \frac{kQq}{(h-x)^2}$

$\Pi_E = Uq$

3.12


y
x



$$a \ln r \Big|_{r_1}^{r_2} =$$

$$= a\left(\ln r_2 - \ln r_1\right)$$