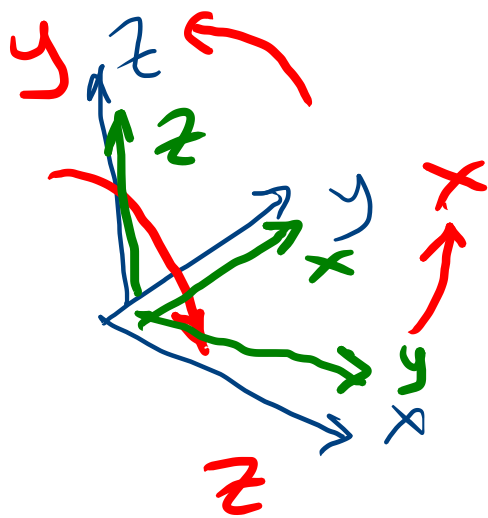


$$y' < y$$

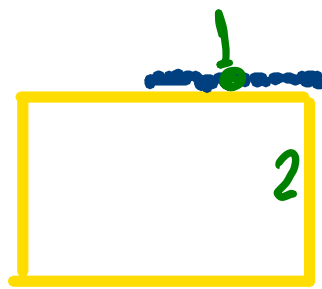
$$y' = y$$

$$\vec{a} \times \vec{b} = \begin{vmatrix} \hat{x} & \hat{y} & \hat{z} \\ a_x & a_y & a_z \\ b_x & b_y & b_z \end{vmatrix} = - \begin{vmatrix} \hat{y} & \hat{x} & \hat{z} \\ a_y & a_x & a_z \\ b_y & b_x & b_z \end{vmatrix}$$

$$= \begin{vmatrix} \hat{y} & \hat{z} & \hat{x} \\ a_y & a_z & a_x \\ b_y & b_z & b_x \end{vmatrix}$$







$$\Delta E_k = W_{F_{\text{ext}}}$$

$$U_{T \text{ ext}} = \dots$$

$$W_N = 0$$

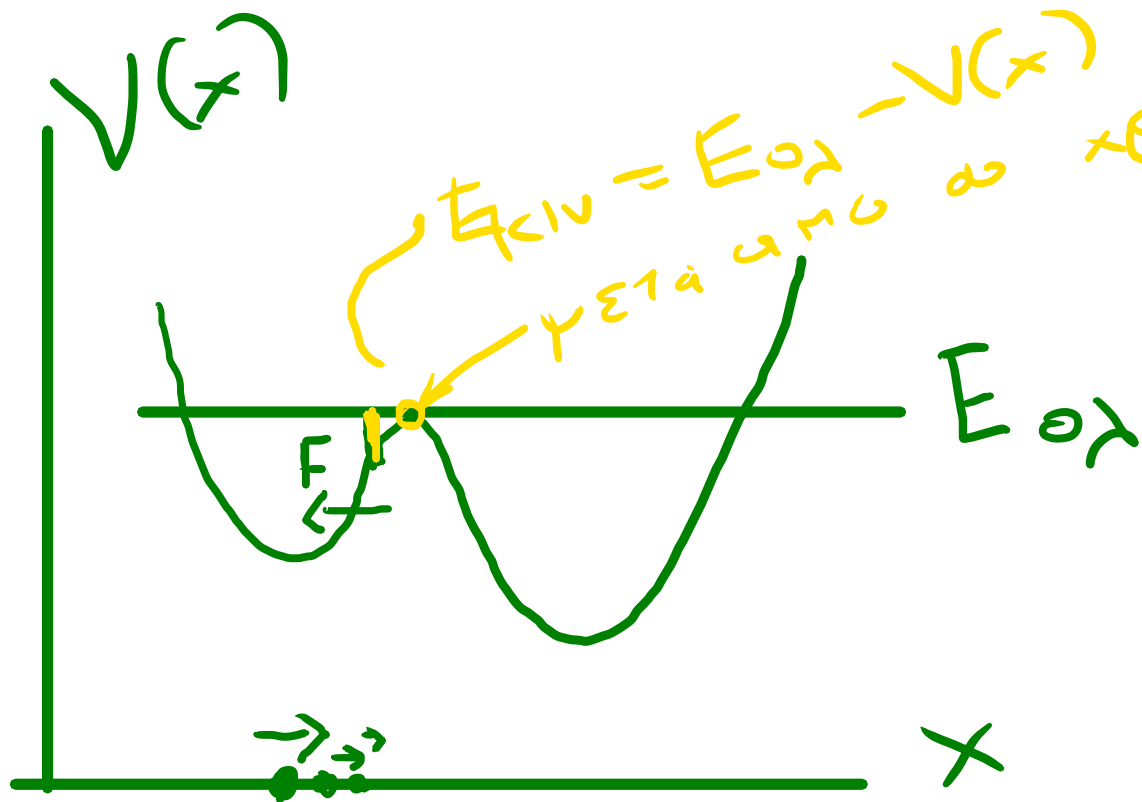
$$\vec{N} \perp d\vec{s}$$

B, N

$$W_B = B_1 \frac{x_1}{2} + B_2 x_1$$

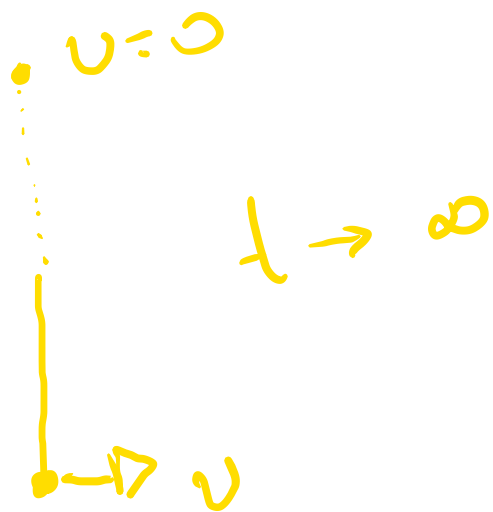
$$B_1 = B \frac{x_1}{L}$$

$$B_2 = B \left(1 - \frac{x_1}{L}\right)$$

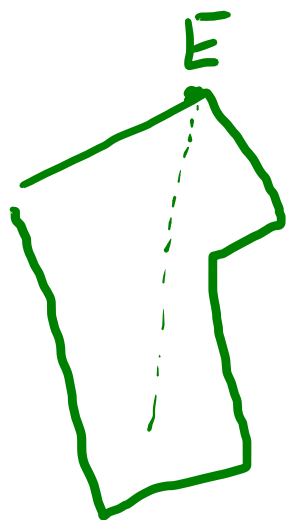
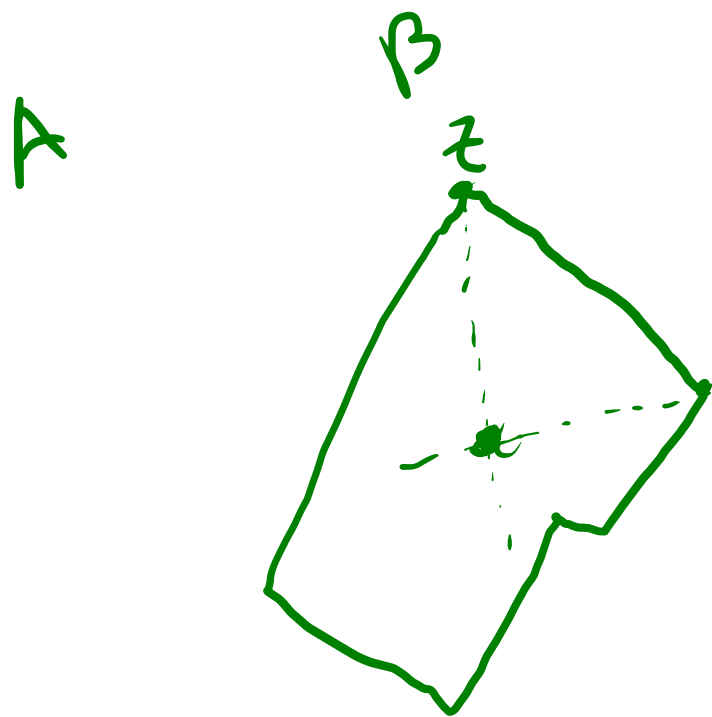
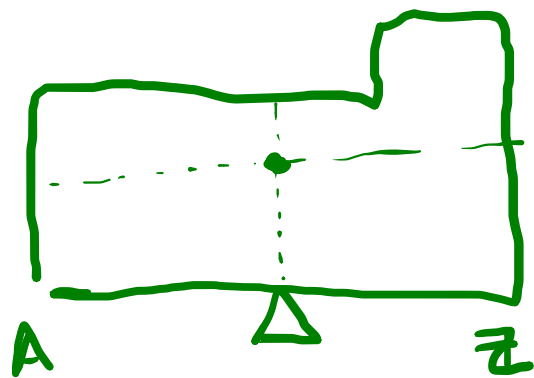
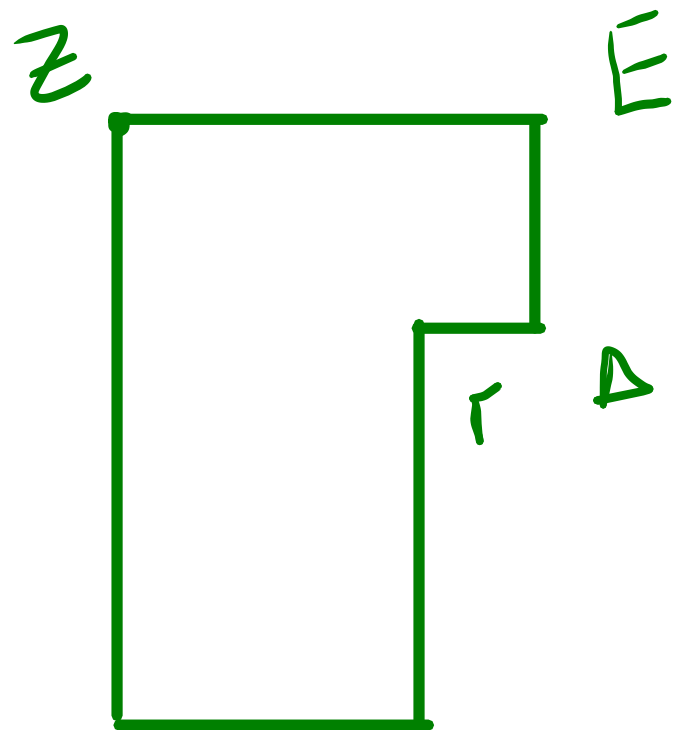


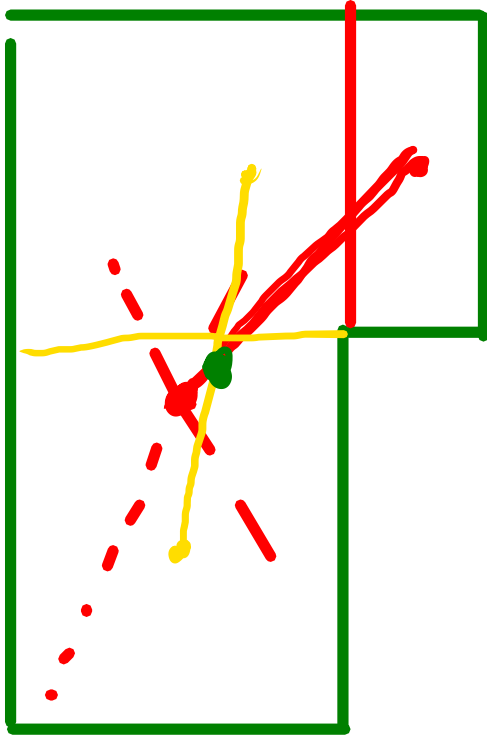
$$m \frac{d^2 x}{dt^2} = F$$

$$t \rightarrow -t = T$$



$$m \frac{d^2 x}{dT^2} = F$$





.

$$T(x, y, z, t)$$

$$\vec{\nabla} T = \hat{x} \frac{\partial T}{\partial x} + \hat{y} \frac{\partial T}{\partial y} + \hat{z} \frac{\partial T}{\partial z} = \vec{A}(x, y, z, t)$$

$$T(x(t), y(t), z(t), t)$$

$$\begin{aligned} T &= \max \\ \vec{\nabla} T &= \vec{0} \end{aligned}$$

$$\begin{aligned} \frac{dT}{dt} &= \frac{\partial T}{\partial x} \frac{dx}{dt} + \frac{\partial T}{\partial y} \frac{dy}{dt} + \frac{\partial T}{\partial z} \frac{dz}{dt} + \frac{\partial T}{\partial t} \\ &= f(t) \end{aligned}$$





$$\Delta F = -m(g_{ik} - g_{in})$$

$$= m \frac{dg}{dr} h$$

$$g = \frac{GM}{r^2} \quad \frac{dg}{dr} = -\frac{2GM}{r^3}$$

$$\Delta F = m \frac{2GM}{r^3} h = \frac{2GMm}{r^2} \frac{h}{r}$$

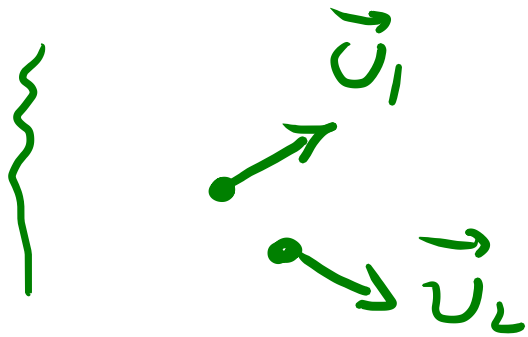
B

M<sub>T</sub>

The diagram shows a circle labeled 'M<sub>T</sub>' with a radius vector 'R' pointing to its top edge. The radius is labeled with the equation  $R = \frac{2GM}{c^2}$ . A small line segment labeled 'h' is drawn at the top edge, perpendicular to the radius vector. An arrow points from the 'h' in the equation above to this 'h'.

•  $\exists \downarrow$

•  $U = U$   
•  $m$



$$\gamma m \vec{U} + 0 = \gamma_1 m \vec{U}_1 + \gamma_2 m \vec{U}_2 \quad \text{δ1α7. ΓX. ορρ}$$

$$\gamma m + m = \gamma_1 m + \gamma_2 m \quad \text{δ1α7. ΓX. ενίρδ.}$$

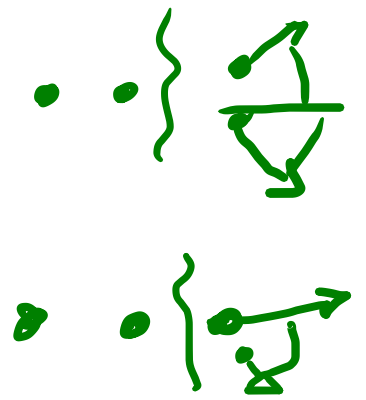
$$\left. \begin{aligned} \gamma \vec{U} &= \gamma_1 \vec{U}_1 + \gamma_2 \vec{U}_2 \\ 1 + \gamma &= \gamma_1 + \gamma_2 \end{aligned} \right\}$$



$$v^2 = v_1^2 + v_2^2 \rightarrow v^2 - v_1^2 = v_2^2$$

$$\vec{v} = \vec{v}_1 + \vec{v}_2 \rightarrow \vec{v} - \vec{v}_1 = \vec{v}_2$$

$$(\vec{v} + \vec{v}_1) \cdot \vec{v}_2$$

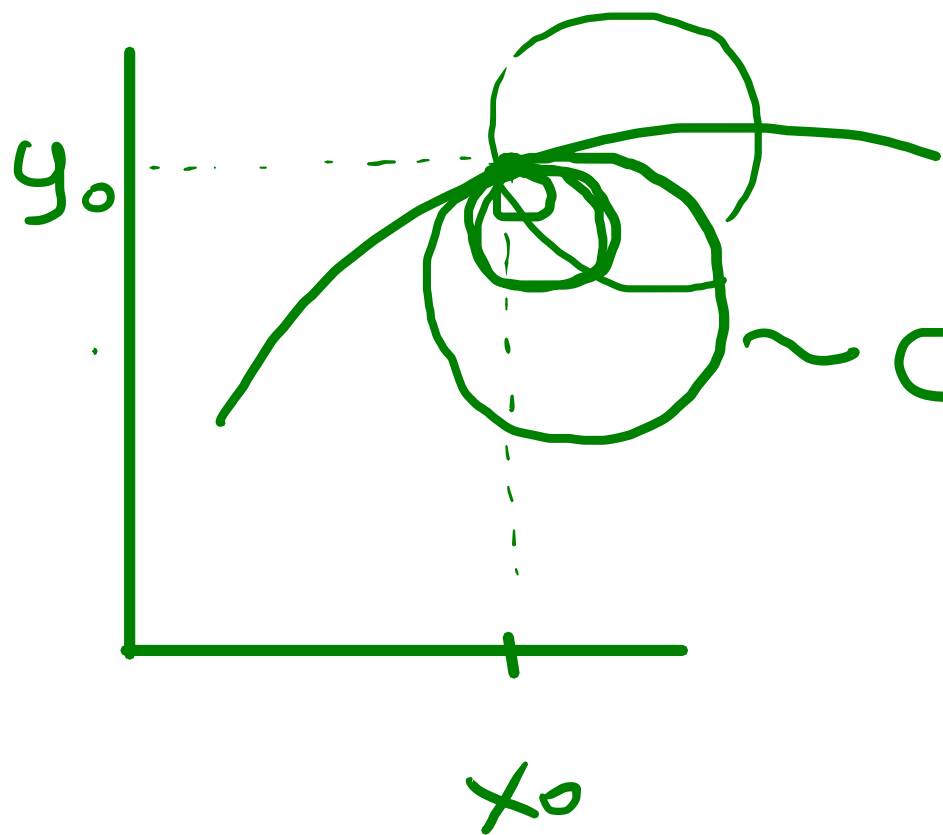


$$v_2^2 = v^2 - v_1^2 = (\vec{v} + \vec{v}_1) \cdot \vec{v}_2$$

$$= (2\vec{v} - \vec{v}_2) \cdot \vec{v}_2$$

$$\cancel{2v_2^2} = 2\vec{v} \cdot \vec{v}_2 = 2(\vec{v}_1 + \vec{v}_2) \cdot \vec{v}_2$$

$\vec{v}_1 \perp \vec{v}_2$



$$y = f(x)$$

$$\sim C: (x - x_1)^2 + (y - y_1)^2 = R^2$$

$$1) (x_0 - x_1)^2 + (y_0 - y_1)^2 = R^2$$

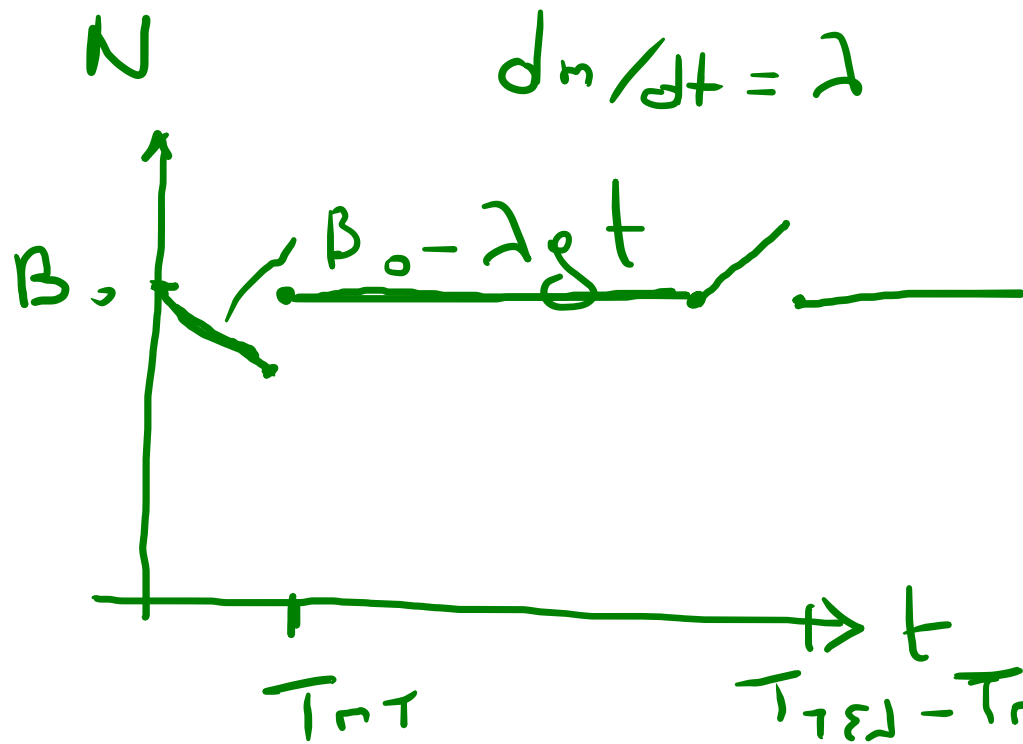
$$2) 2(x_0 - x_1) + 2(y_0 - y_1) \frac{dy}{dx} \Big|_{x_0, y_0} = 0$$

$$\rightarrow 2(x - x_1) dx + 2(y - y_1) dy = 0$$

$$y - y_1 = \sqrt{R^2 - (x - x_1)^2}$$

$$\frac{d^2 y}{dx^2} \Big|_{x_0} = f''(x_0) \quad 3)$$

$$B_0 = B_k + B_{\text{air}} \quad \text{diagram.}$$



$$B_0 - \lambda g T_{\text{off}}$$

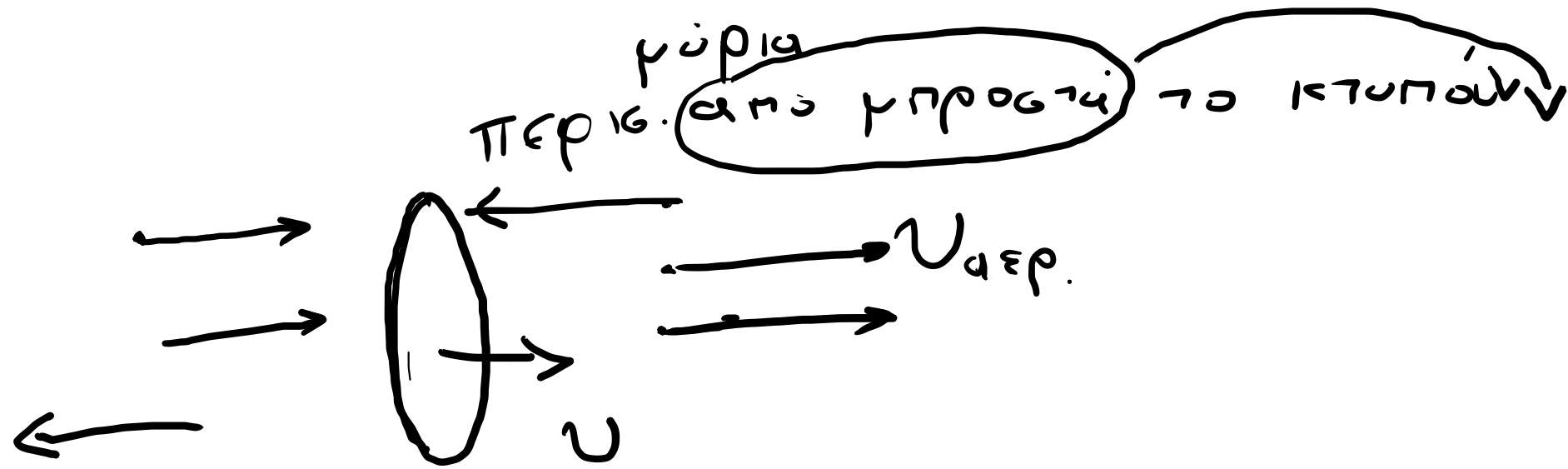
$$N_{T_{\text{off}}} = B_0 - \lambda \int_0^{T_{\text{off}}} \sqrt{2gh} dt + F$$

$$P_{\text{in}} = \dot{m} \sqrt{2gh}$$

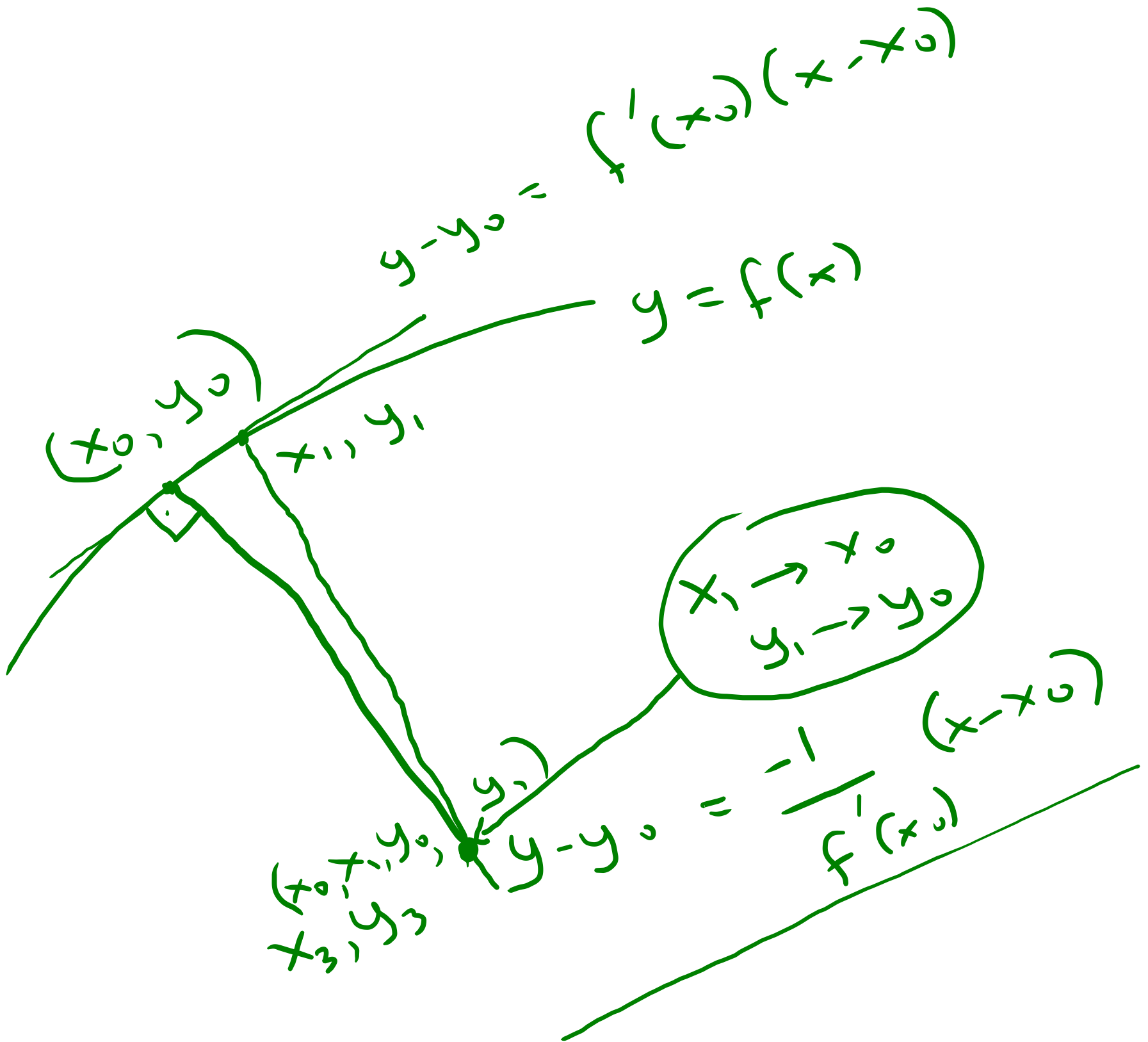
$$P_{\text{out}} = \dots$$

$$F_k = \frac{dp}{dt} = \frac{dm}{dt} \sqrt{2gh} = \lambda \sqrt{2gh}$$

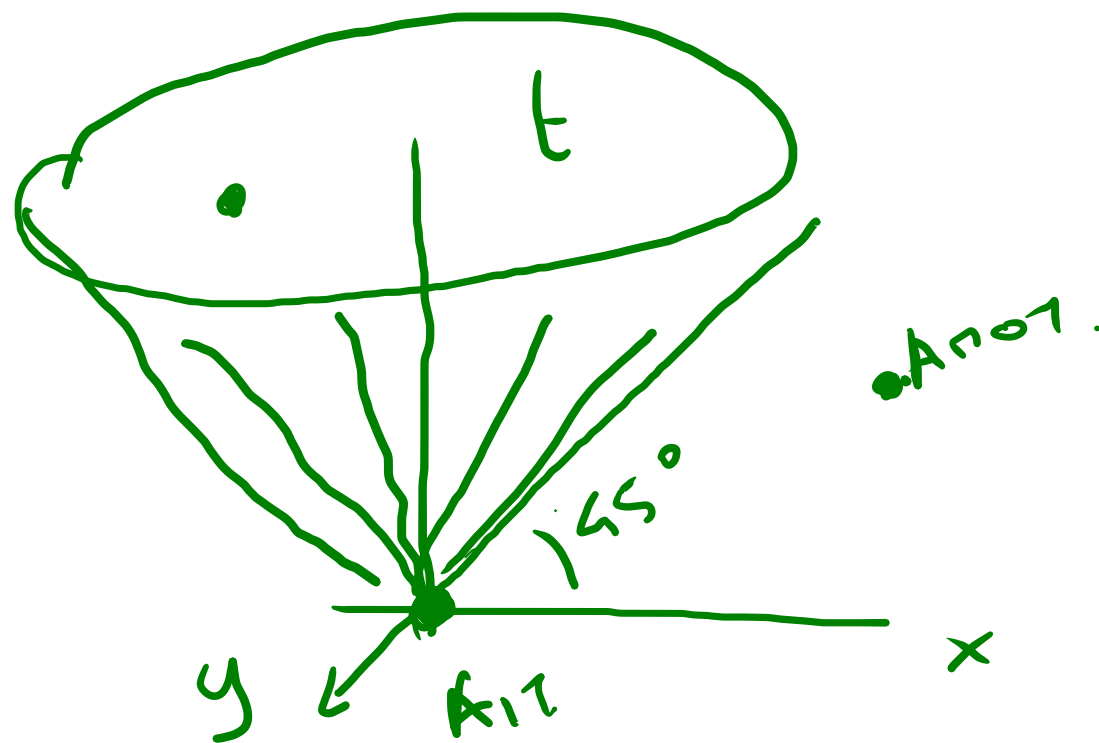
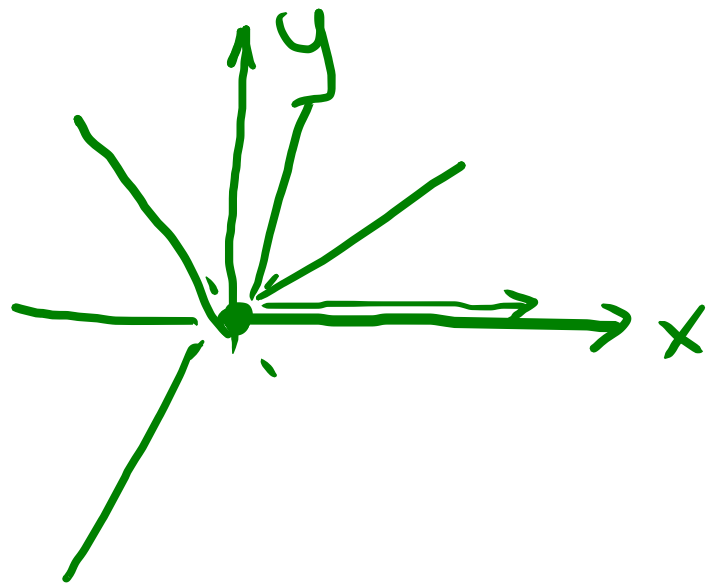
$$N_{T_{\text{off}}} = B_0 - \sqrt{\lambda^2 2gh} + \sqrt{\lambda^2 2gh} = B_0$$



$$F_{\alpha\nu\tau} \propto u^2$$



Κώνος φωτός



$$x = ct$$

$$c = 1 \text{ l: lyrs}$$

$$t = \text{yrs}$$

$$c = \frac{1 \text{ lyrs}}{1 \text{ yr}}$$