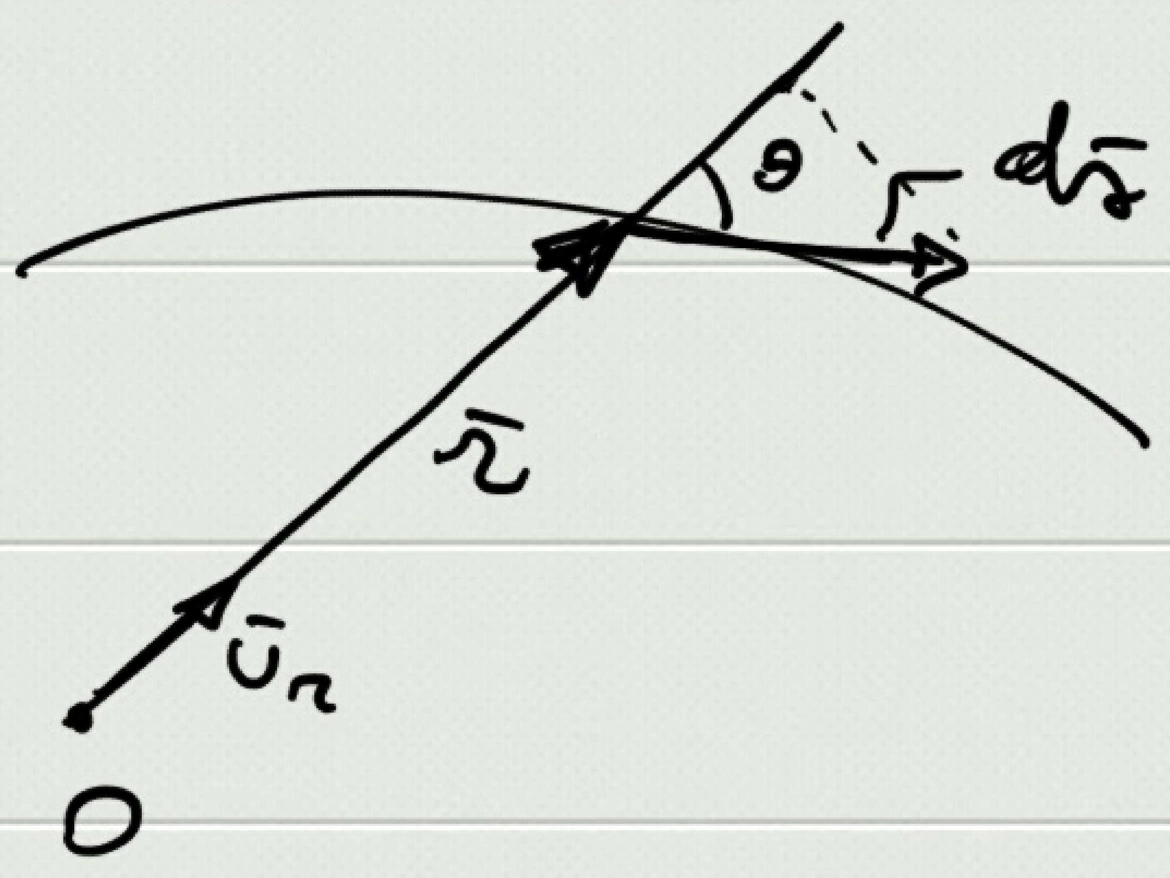
$$W_{A\to B} = \int_A^B -\gamma \frac{m m'}{r^2} \bar{u}_r \, d\bar{s} =$$



$$= -\gamma m m' \int_A^B \frac{1}{r^2} \, dr =$$

$$= -\gamma m m' \int_{r_A}^{r_B} \frac{dr}{r^2} = -\gamma m m' \left[-\frac{1}{r} \right]_{r_A}^{r_B} =$$

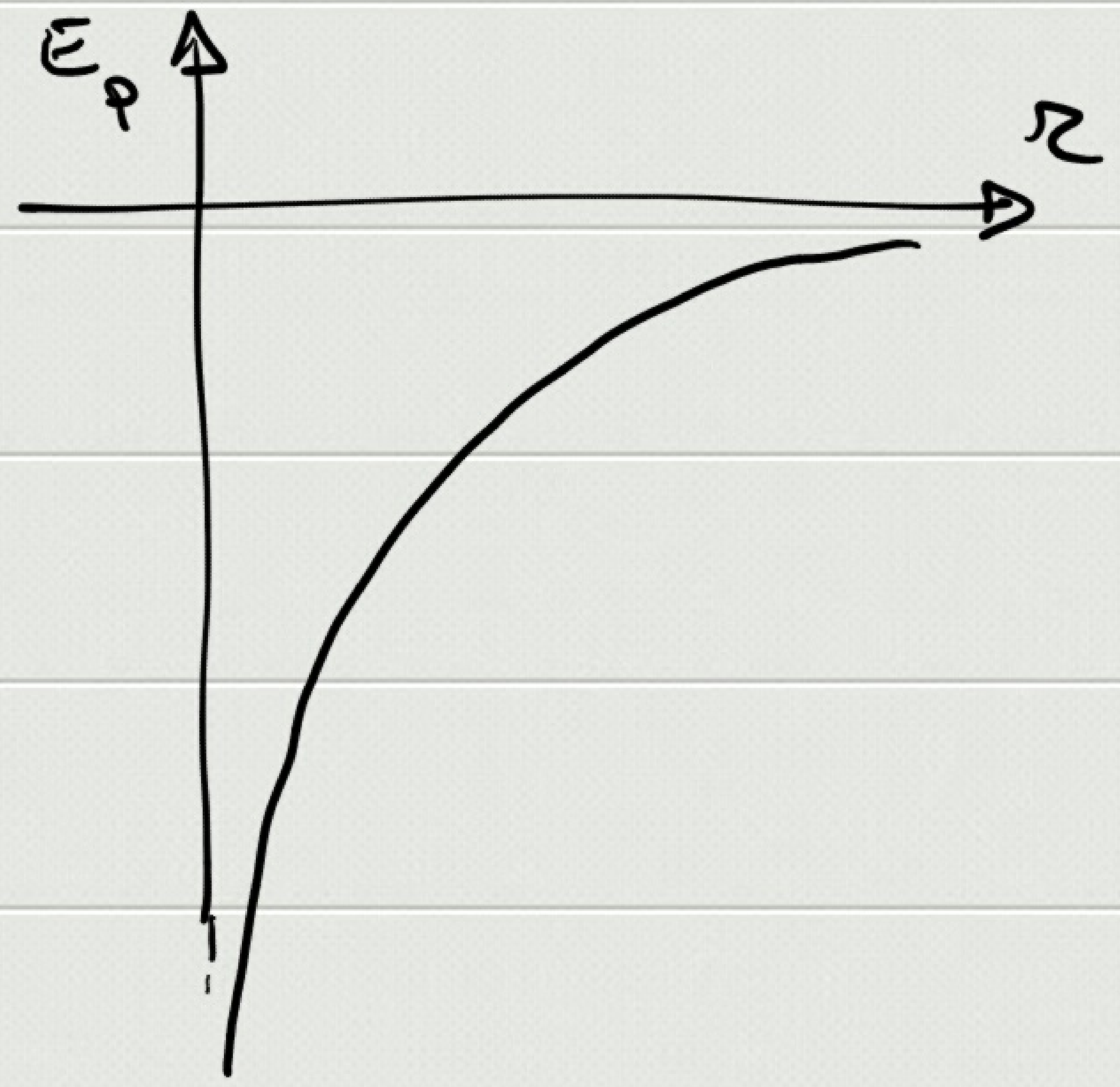
$$= \gamma m m' \left(\frac{1}{r_B} - \frac{1}{r_A} \right) = -\Delta E_{p,G}$$

$$\Rightarrow \boxed{E_{p,G} = -\gamma \frac{m m'}{r} + \text{cost}}$$

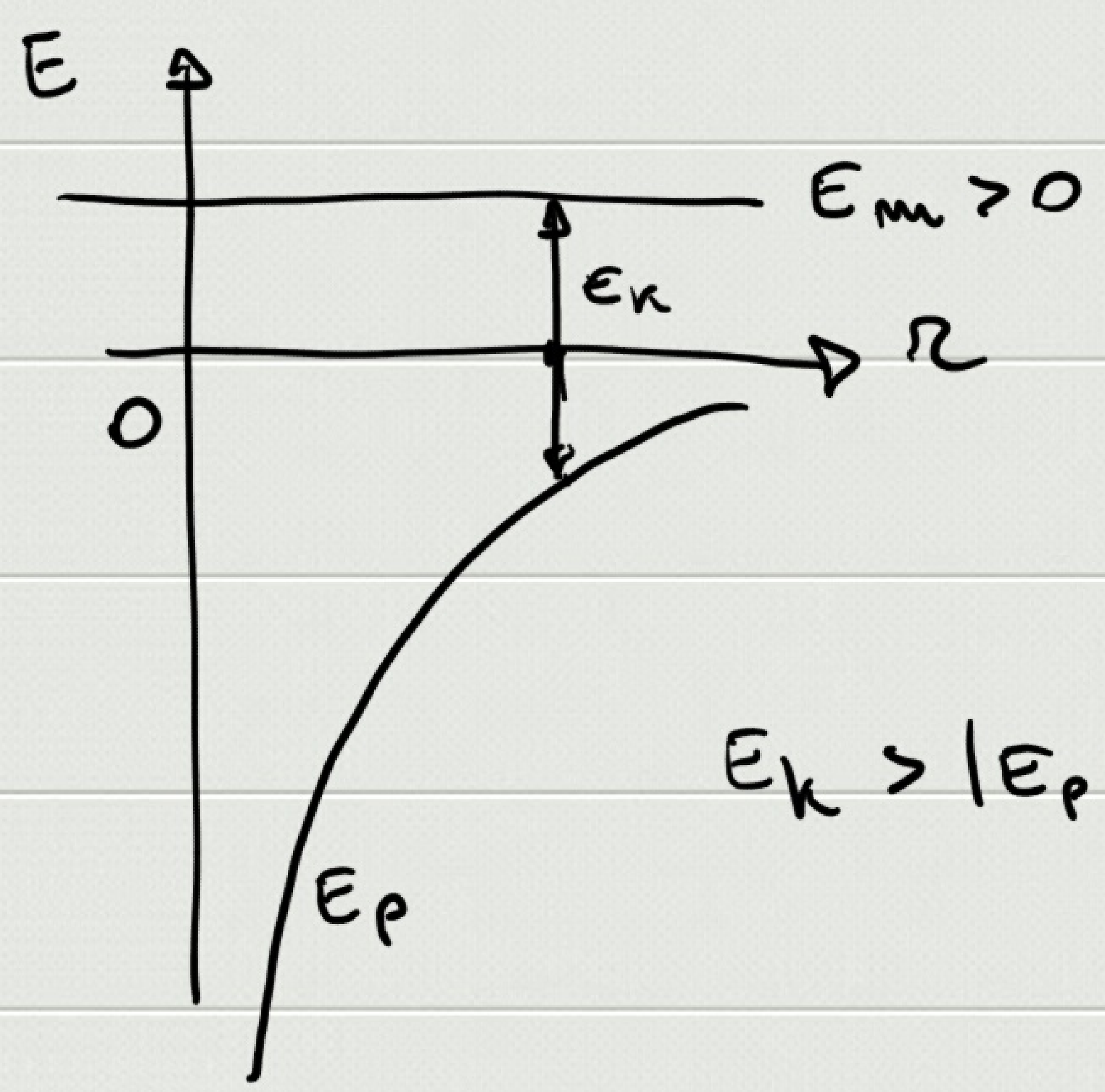
$r \to \infty \qquad F_G \to 0 \qquad E_p \to 0 \Rightarrow \text{cost} = 0$

$$\boxed{E_{p,G} = -\gamma \frac{m m'}{r}} \qquad \underline{\underline{< 0}}$$

$$E_p = -\gamma \frac{m m'}{r}$$



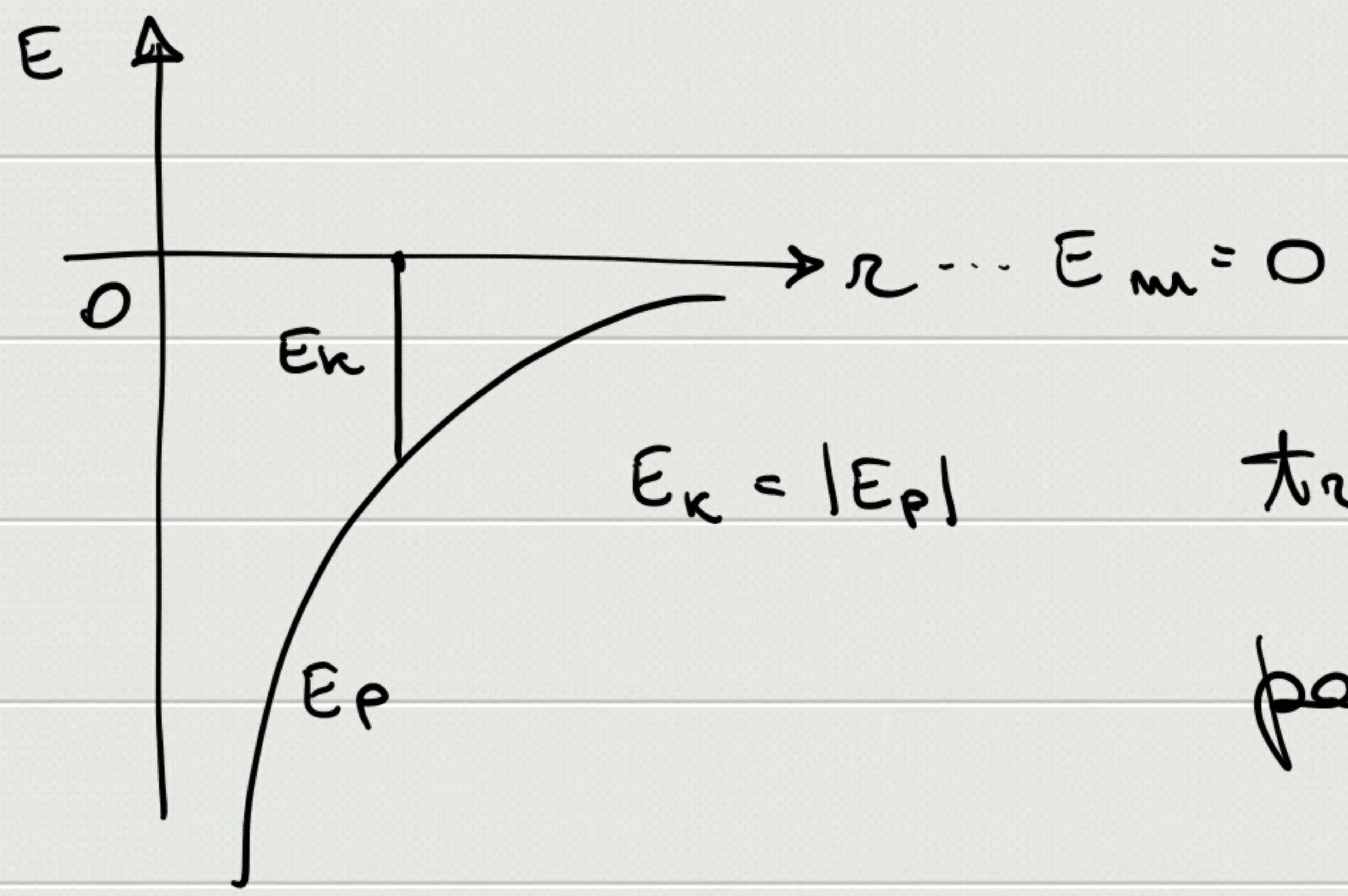
$$E_m = E_k + E_p = \text{cost} \begin{cases} > 0 \\ = 0 \\ < 0 \end{cases}$$



traiettoria

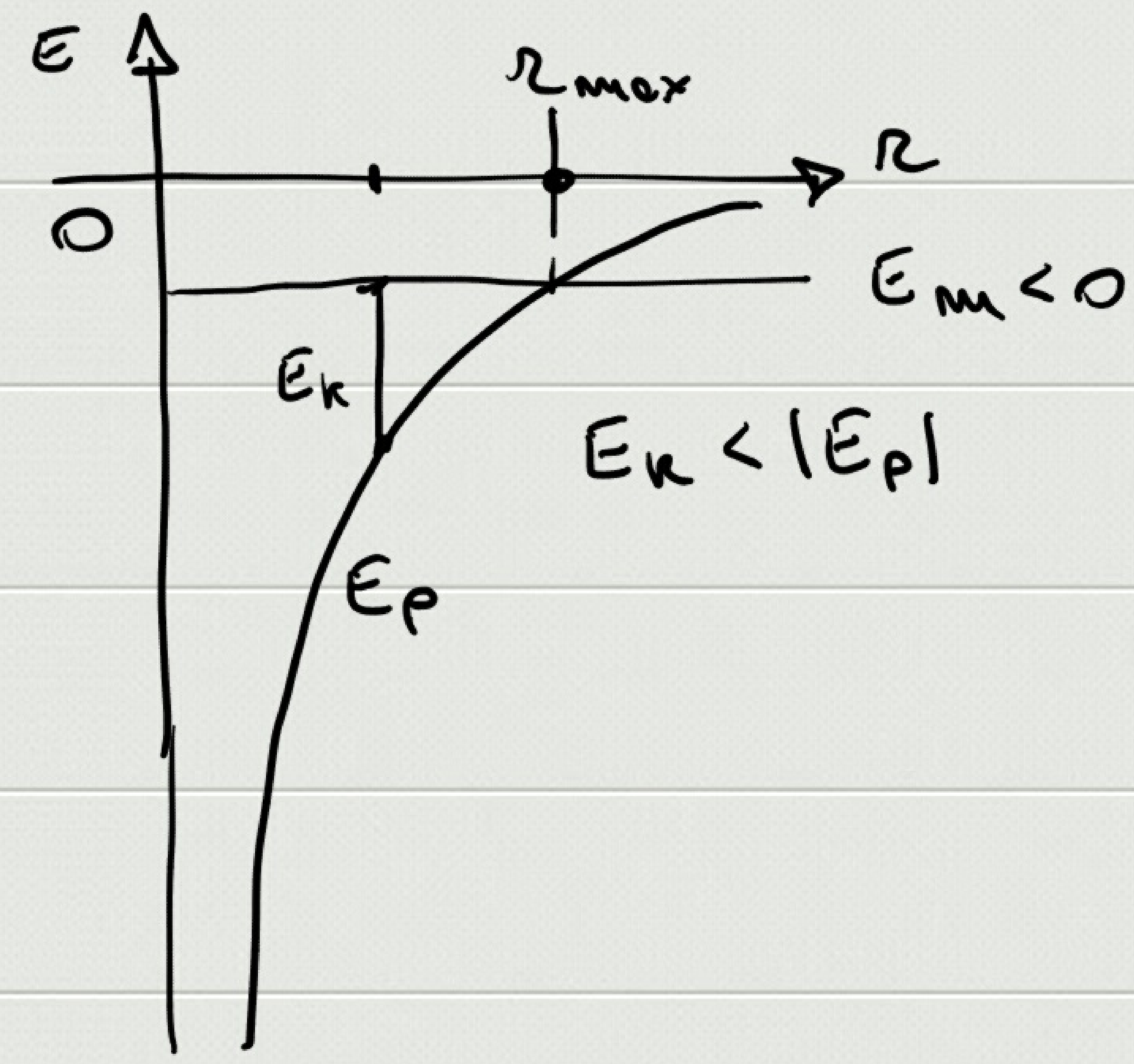
iperbolica

$E_k > |E_p|$



traiettoria

parabolica



traiettoria

ellittica

Velocità di fuga dalla Terra $(r_T \to \infty)$

$$E_{m,i} = E_{m,f} \Rightarrow \frac{1}{2} \cancel{m} v_i^2 - \gamma \frac{m_T \cancel{m}}{r_T} = \frac{1}{2} \cancel{m} v_f^2$$

$$\Rightarrow v_i = \sqrt{v_f^2 + 2\gamma \frac{m_T}{r_T}}$$

$$v_F : v_i \left(v_f = 0 \right) \Rightarrow v_F = \sqrt{2\gamma \frac{m_T}{r_T}} \simeq 1.12 \cdot 10^4 \ m/s$$