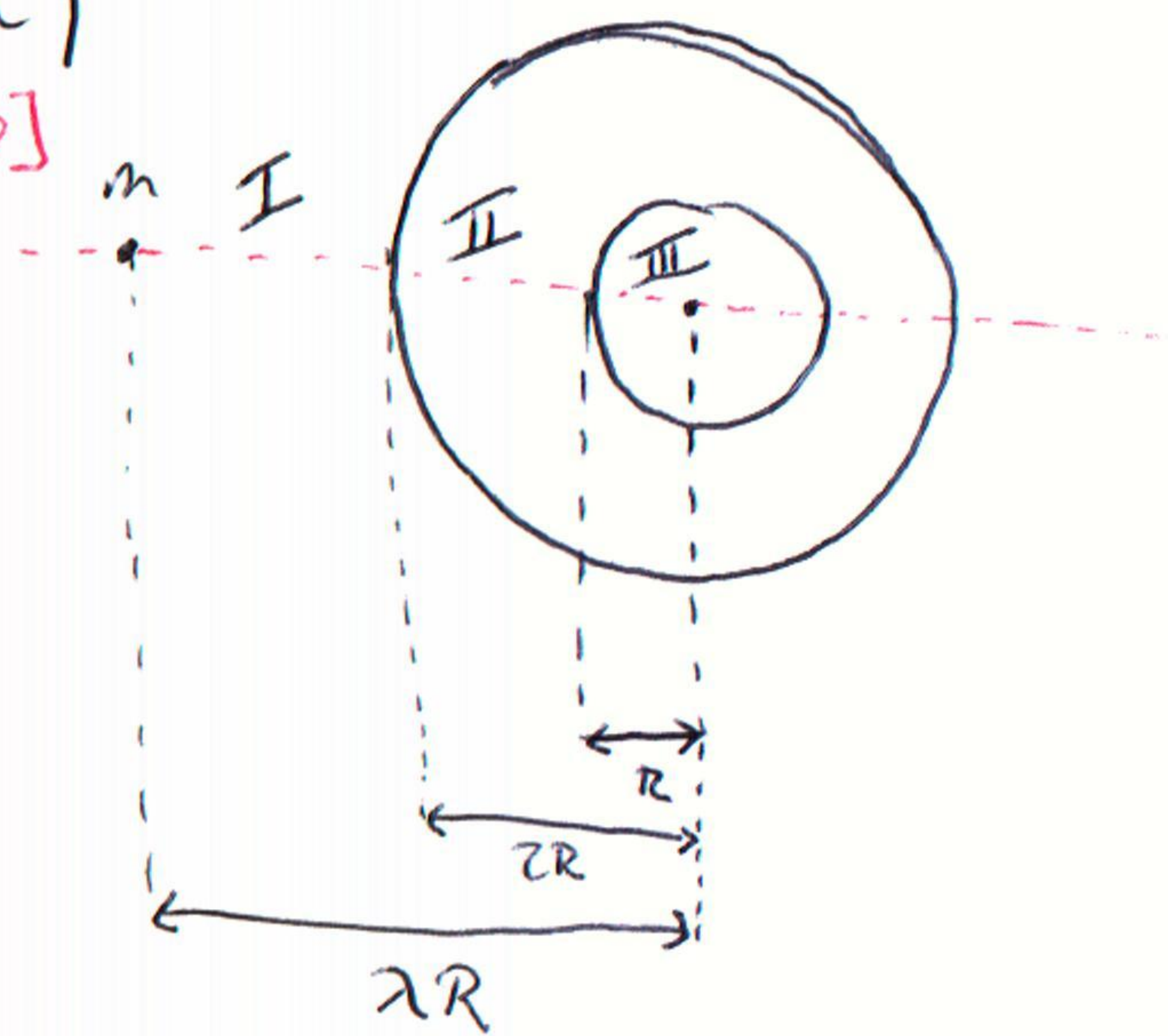


1a)

[3.0]



$$F_{SI} = 2 \frac{GMm}{r^2}$$

$$|r| \in [2R, \infty]$$

$$F_{SII} = \frac{GMm}{r^2}$$

$$|r| \in [R, 2R)$$

$$F_{SIII} = 0$$

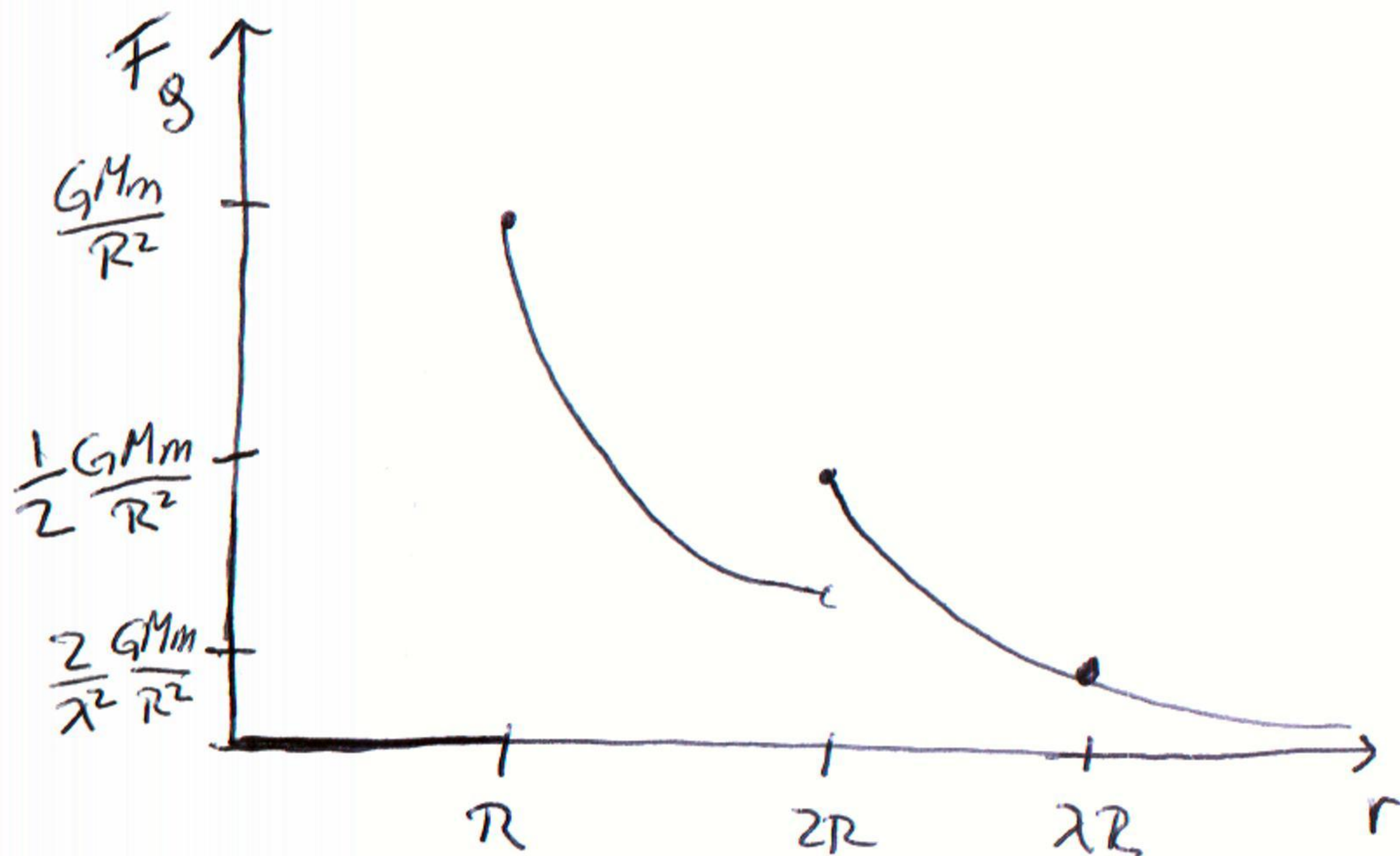
$$|r| \in [0, R) \quad (0.5)$$

$$\text{Asi } F(2R) = \frac{2}{\lambda^2} \frac{GMm}{R^2}$$

$$F(2R) = \frac{1}{2} \frac{GMm}{R^2}$$

$$F(R) = \frac{GMm}{R^2}$$

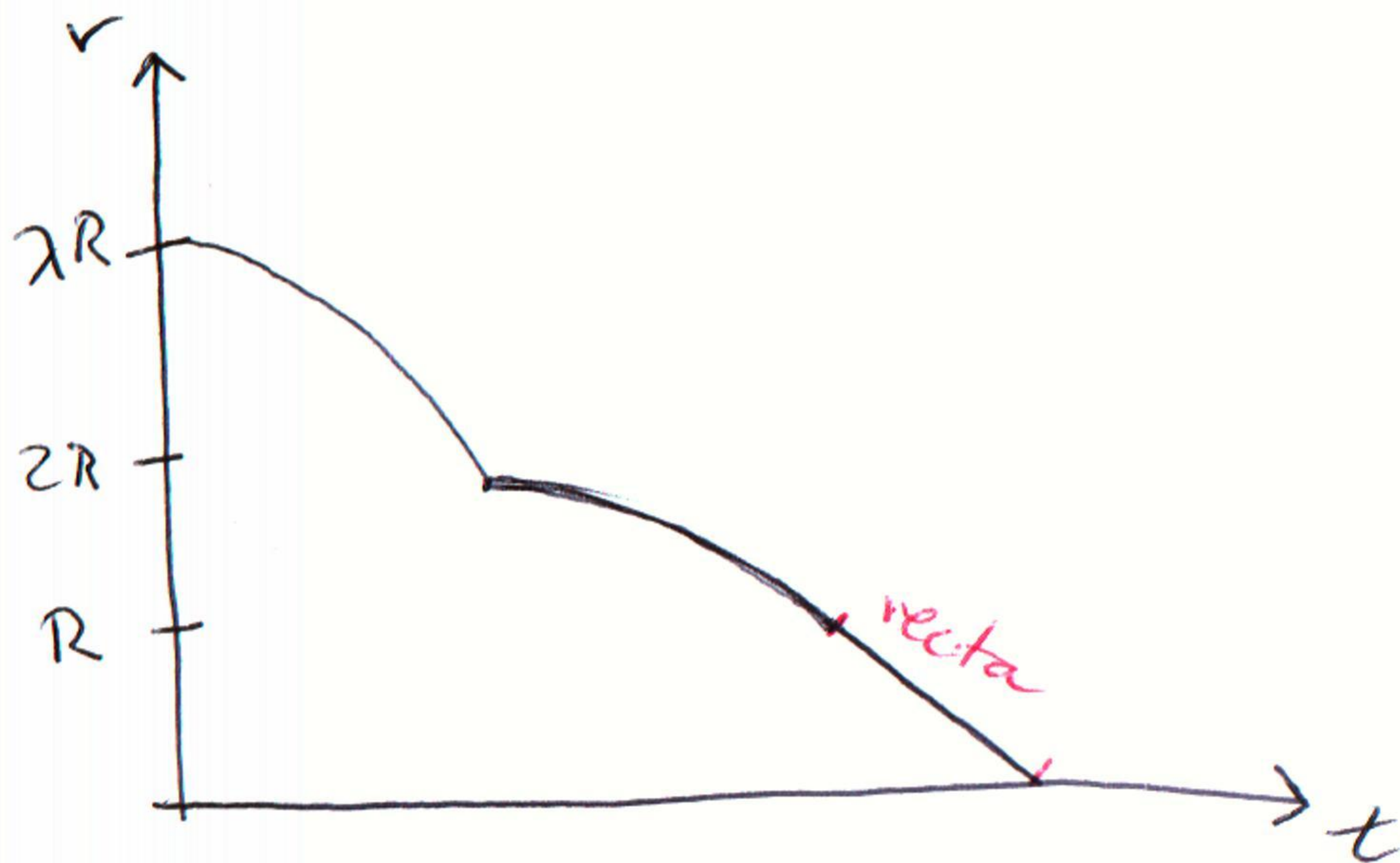
(0.5) %



(1.0)

1b)

[1.0]



(1.0)

1c) En el interior del segundo cascarón como no
[2.0] Actúa la fuerza la rapidez se mantiene constante:

$$E_i = E_f \Rightarrow \frac{2GMm}{\lambda R} + 0 = 0 + \frac{1}{2}mv^2 \quad (1.0)$$

$$v = 2 \sqrt{\frac{GM}{\lambda R}}$$

$$d = vt \Rightarrow t = \frac{2R}{2 \sqrt{\frac{GM}{\lambda R}}} \quad (1.0)$$

$$t = R \sqrt{\frac{\lambda R}{GM}}$$