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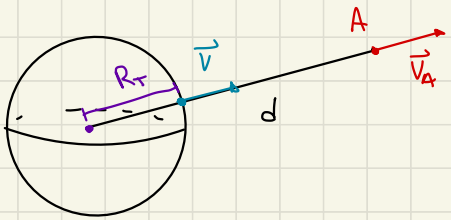

$d = 12500 km$
$v = V_f$

$V_A = ?$

L'energia si conserva

$$E_i = K_T + K_p + \mathcal{U} = 0 + \frac{1}{2} m V_f^2 + \left(- G \frac{m M_T}{R_T} \right)$$

$$E_A = K_T + K_p + \mathcal{U} = 0 + \frac{1}{2} m V_A^2 + \left(- G \frac{m M_T}{d} \right)$$

$E_i = E_A$

$$\frac{1}{2} m V_f^2 - G \frac{m M_T}{R_T} = \frac{1}{2} m V_A^2 - G \frac{m M_T}{d}$$

$$V_f^2 = \frac{2 G M_T}{R_T}$$

$$\frac{1}{2} \cdot 2 \frac{G M_T}{R_T} - G \frac{M_T}{R_T} = \frac{1}{2} V_A^2 - \frac{G M_T}{d}$$

$$V_A^2 = \frac{2 G M_T}{d}$$

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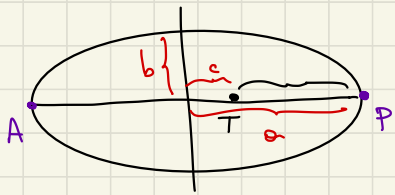

$r_p = a - c = 3,6 \cdot 10^5 km$
$r_a = a + c = 4,06 \cdot 10^5 km$

$W_{A \to P} = ?$

$$W_{A \to P} = - \Delta U = - (U_p - U_A) = \frac{G M_T M_L}{r_p} - \frac{G M_T M_L}{r_a} =$$

$$= G M_T M_L \left(\frac{1}{r_p} - \frac{1}{r_a} \right) = G M_T M_L \left(\frac{r_a - r_p}{r_a r_p} \right)$$

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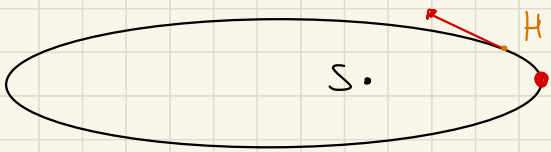

$a = 17{,}83$ UA

$1\,UA = 1{,}496 \cdot 10^{11}\,m$

Nel 1986 la cometa si vedeva perché in perigeo.

È possibile che Fi.Mo. veda la cometa?

Sappiamo che $\frac{a^3}{T^2} = k = \frac{GM_T}{4\pi^2} \rightsquigarrow T^2 = \frac{4\pi^2}{GM_S} a^3$

$$\rightsquigarrow T = 2\pi a \sqrt{\frac{a}{GM_S}} = 2\pi \cdot 17{,}83 \cdot 1{,}496 \cdot 10^{11} \sqrt{\frac{17{,}83 \cdot 1{,}496 \cdot 10^{11}}{6{,}67 \cdot 10^{-11} \cdot 1{,}99 \cdot 10^{30}}}\ s$$

$= \ldots \simeq 76$ anni

Salvo incidenti, Fi.mo. vedrà la cometa.

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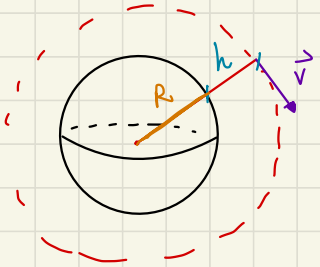

$R = 5{,}42 \cdot 10^6\,m$ $\quad \boxed{v = \frac{1}{3} v_f}$ $\quad h = ?$

$v = \sqrt{\frac{GM}{R+h}}$ $\qquad v_f = \sqrt{\frac{2GM}{R}}$

$v^2 = \frac{1}{9} v_f^2$

$\frac{GM}{R+h} = \frac{1}{9} \frac{2GM}{R} \rightsquigarrow 2R + 2h = 9R$

$\rightsquigarrow \boxed{h = \frac{7}{2} R}$