AP 97 – AII

1.1 $C_M = \frac{T^2}{r^3} \Rightarrow C_V = 1{,}24 \cdot 10^{-4} \frac{d^2}{m^3}$; $C_p = 1{,}24 \cdot 10^{-4} \frac{d^2}{m^3}$; $C_D = 1{,}224 \cdot 10^{-4} \frac{d^2}{m^3}$

1.2. $F_z = F_G \Leftrightarrow m \cdot \frac{4\pi^2 r^2}{T^2 r} = G \frac{m m_m}{r^2} \Leftrightarrow T^2 = \underbrace{\frac{4\pi^2}{G m_m}}_{C} \cdot r^3$

$C = \frac{4\pi^2}{G m_m} \Leftrightarrow m_m = \frac{4\pi^2}{GC} = \underline{6{,}39 \cdot 10^{23}\,kg}$

1.3.1 Freier Fall: $y = \frac{1}{2} g t^2 \Leftrightarrow g = \frac{2y}{t^2} = 3{,}73 \frac{m}{s^2}$

$G \frac{m_m \cancel{m_k}}{r_M^2} = \cancel{m_k} g \Leftrightarrow r_m = \sqrt{\frac{G m_M}{g}} = \underline{3{,}38 \cdot 10^6\,m}$

1.3.2 $E_{kin} = \frac{1}{2} m_V v^2 = \frac{1}{2} m_V \cdot \left(\frac{2\pi r_m}{T_M}\right)^2 = \underline{6{,}69 \cdot 10^7\,J}$

1.4.1 $r_S = \sqrt[3]{\frac{T_M^2}{C}} = \underline{20{,}4 \cdot 10^6\,m}$