9)

$\omega_T = \frac{2\pi}{T}$ con $T = 86164s$ (período sideral).

$$\omega_T = \frac{2\pi}{86164s} = 7{,}2921 \cdot 10^{-5} \frac{rad}{s}$$

* Usamos la tercera ley de kepler para orbita circular:

$$T^2 = \frac{4\pi^2 r^3}{\mu} \Rightarrow r = \left(\frac{\mu T^2}{4\pi^2}\right)^{1/3}$$

$$r = \left(\frac{398600{,}4418 \frac{km^3}{s^2}}{4\pi^2} \cdot (86164)^2 \, s^2\right)^{1/3}$$

$$r = 42164{,}14 km$$

$$h = r - R_T = 42164{,}14 km - 6371 km = 35793{,}14 km$$

$$v_a = v_p = \sqrt{\frac{\mu}{r}} = 3,07 \frac{km}{s}$$