

75. Information relevant to this calculation can be found in Appendix C or on the inside front cover of the textbook. The angular speed is constant so

$$\omega = \frac{2\pi}{T} = \frac{2\pi}{86400} = 7.3 \times 10^{-5} \text{ rad/s} .$$

Thus, with $m = 84 \text{ kg}$ and $R = 6.37 \times 10^6 \text{ m}$, we find $\ell = mR^2\omega = 2.5 \times 10^{11} \text{ kg}\cdot\text{m}^2/\text{s}$.