HW 8-2 Soln)

First, find the angular momentum of the moon about the earth (approximately).

$$L = I\omega = mr^2 \frac{2\pi}{P},$$

with m the moon's mass, r the radius for the earth, and P the period of revolution, one month.

Then, since

$$L = n\hbar\,,$$

$$n = mr^2 \frac{2\pi}{P\hbar} = (7.3 \times 10^{22})(3.9 \times 10^{8})^2 \frac{2\pi}{(28 \times 24 \times 60 \times 60)1.06 \times 10^{-34}} = 2.7 \times 10^{+68} \quad .$$