1. Derive a formula for the linear velocity of a planet $v(r)$, where r is the distance from Sun (assume circular orbits). Apply your formula to Earth ($r \simeq 150 \cdot 10^6 \, km$). Compare v with the number which follows from the observed period of $1 \, year$.

2. Find the kinetic K, potential U and full energy E for Earth ($M_E \simeq 6 \cdot 10^{24} \, kg$).

3. Calculate the period of revolution for an asteroid $600 \cdot 10^6 \, km$ from Sun (assume a circular orbit).

4. Find the length of a simple pendulum designed to have an oscillation period of $2 \, s$ on Earth. What will be its oscillation period on Moon? On Jupiter?