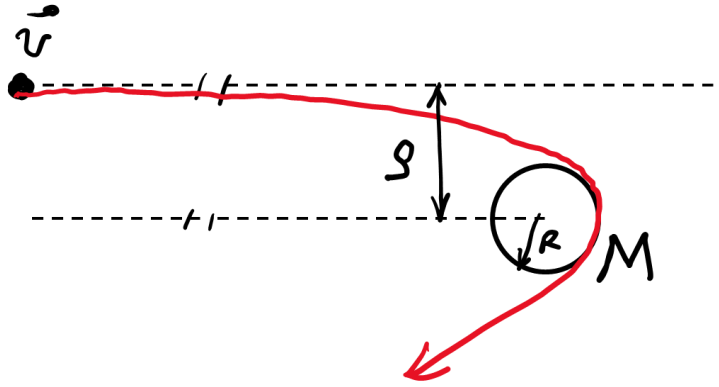
Homework 23

1. A space probe approaches a planet of radius $R$and mass $M$from a large distance with velocity $v$relative to the planet. What value of the impact parameter ρ will ensure that the probe passes as close as possible to the planet without crashing into it?



2. A spacecraft rotates about its axis with angular velocity Ω. How does the oscillation period of a pendulum of length l depend on the distance R from the suspension point to the axis of rotation? The plane of oscillations passes through the axis of rotation.
3. Estimate how long does it take for the Earth to fall down to the Sun.