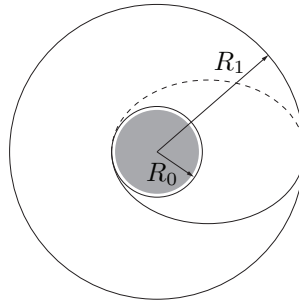


M07M.1 - Planetary Orbits

Problem

A satellite in a low Earth circular orbit with Radius R_0 has an orbital period T_0 .

- a) How long does it take to transfer the satellite into a new circular orbit with a larger radius R_1 using the Hohmann transfer ellipse shown in the figure?



- b) Suppose a large shower of asteroids (much larger than the Earth diameter) came to Earth from a distant source, all moving with the same initial velocity v . If the areal number density of asteroids in the shower (the number of asteroids crossing a unit area perpendicular to the initial velocity) is n , how many of them will hit the Earth? You can ignore the effects of other bodies in the Solar system.