

Written Homework #7

Physics 131 Spring 2009

Due on Friday 27 March 2009 at the beginning of lecture.

Write down your name and student ID number.

Consider the force due to gravity.

- a. Given that the mass of the Moon is $M_{Moon} = 7.35 \times 10^{22}$ kg and its radius is $R_{Moon} = 1.74 \times 10^3$ km, calculate the acceleration due to gravity on the surface of the Moon.
- b. Given that the mass of the Earth is $M_{Earth} = 5.96 \times 10^{24}$ kg and its radius is $R_{Earth} = 6.37 \times 10^3$ km, calculate the acceleration due to gravity 10 km above the surface of the Earth.
- c. Given that the distance between the Earth and the Moon is $d = 3.84 \times 10^8$ m, show that a satellite located exactly in-between the Earth and the Moon at a distance of 90% d from the Earth experiences no net force (at least when only the gravitational force due to the Earth and the Moon are taken into account). Draw a diagram showing the forces acting on the satellite.

Show your work to get full credit.