Physics 20
# Chapter 4 Worksheet

Answer the following questions on a separate sheet. Make sure to follow all rules for setting up a question, sig digs, and scientific notation when appropriate.

1. There is a 250mL water bottle sitting on your desk. **Determine**...
   a) the water's mass (*0.250kg*)
   b) the water's weight (*2.45N*)
   c) the water's mass on the moon, where the gravitational field strength is 1.67N/kg. (*0.250kg*)

2. The gravitational force between our galaxy and another galaxy is 1.84e-7N. If the other galaxy had been twice the mass and four times further away, **determine** what the gravitational attraction would have been. (*2.3e-8N*)

3. Other than the ability to actually do calculations using the universal law of gravitation, **explain** the interesting side benefit of Cavendish's calculation of "G".

4. **Explain** what is meant by the term "inertial mass."

5. I am on the International Space Station in orbit 420km above the surface of the earth. A grade five student asks me what I think of being some place that has no gravity. I explain that although there is less gravity, there is almost 9.81N/kg.
   a) **Determine** the acceleration due to gravity where I am. (*8.64m/s²*)
   b) My mass is 71 kg. **Determine** what my weight would be in this location if I was not in free fall. (*6.1e2N*)

6. A 135kg box of used socks is sitting in a freight elevator. The elevator begins to rise with an acceleration of 4.31m/s². **Determine** the apparent mass of the socks. (*194kg*)

7. Two young people are standing near each other. The 77.8 kg boy looks at the 51.9 kg girl and says "I feel 7.156e-10 N of attraction to you!" **Determine** how far apart they are from each other. (*19.4m*)