Some problems from Sem. 2

1. At what velocity does a satellite circle the earth at if its 225 km above its surface?

2. What is the weight of the satellite (#1) when its 225 km above the earth's surface if its mass is 1500 kg?

3. Using Newton's variations of Kepler's Third Law, find the mass of a planet if its moon has an orbital radius of 2.7×10^8 m and a period of 35 days (24 hours each)?\

4. Using Kepler's Third Law, calculate the period of a satellite that is four times closer to the earth than the moon is?

5. What force is required to stop a 36 g bullet traveling at 455 km/hr in 0.13 s?

6. A 56 g ball traveling at 12 km/hr strikes a 88 g ball that is stationary. What is the speed of the 88 g ball after the collision if the 56 g ball recoils at 2 km/hr?

7. An 87 kg sled is pulled 133 m using 7,960 J of work. What angle is the pull rope at if a 68 N force is applied along the rope?

8. How much work is required to lift a 55 kg box 4.5 m using an 87 % efficientf machine?

9. What velocity wil a 2.3 kW motor lift a 98 kg object at?

10. How much KE does a 33 N object have if it is traveling at 2.3 m/s?

11. How high would the object in #10 go if were launched straight up with that amount of energy?...no friction...

12. A 65 g pendulum is 0.24 m above a table. a) If it is pulled back to a new position so that it is now 0.37 m above the table, how much PE does it have?

b) What speed will it attain as it passes the equilibrium?

c) How much work is lost to friction if it only attains 0.56 m/s?

13. How much heat is given off if steam at 120 degrees C is condensed and cools to water at 25 degrees C?

14. How long will it take a 20.0 W electric heater to change 35.0 L of water in a 12.4 kg glass tank from 17.0 to 22.0 degrees C? (c of glass is 664 J/kg C)

15. What is the final temperature of an experiment if 78 g of copper at 100.0 degrees C is added to a 125 g aluminum calorimeter cup with 88.0 g of water in it at 22.0 degrees C? (c of aluminum is 930 J/kg C and the c of copper is 385 J/fkg C)

17. a) What buoyancy force is applied to a 76 kg rock that displaces 950 ml of water?
b) What is the apparent weight of the rock in water? (1ml = 1 cm^3)

18. What is the lifting force of a 5.4 cm diameter large piston if 450 N is applied to a 1.2 cm diameter smaller piston?

19. What pressure would be exerted by a water on you if you were 30.0 m below the surface?

20. What is the apparent weight of a 62 cm^3 rock that has density of 4500 kg/m^3 if its put in water?

21. I am 1.76 m high and 79.0 kg. a) What is my S.G. if 1.60 m of me is under water? B) What is my volume? C) What is my apparent weight?

22. A 2.4 kg block in on a 30.0^0 frictionless ramp that is 66.0 cm long. A 1.9 kg block is at the bottom of the ramp waiting to be hit by the descending 2.4 kg block. What speed do the two travel at (on the horizontal) after the 2.4 kg strikes the 1.9 kg block and they stick together as they move off?