**Homework: Pressure, Buoyancy, and Archimedes’ Principle**

Show all of your work, you may use a separate sheet of paper. You may use the equations from the lab handout.

1. Consider the two feet of a 150kg person, where each foot covers an area of about 250cm2. Calculate the pressure exerted by the two feet on the ground. What if the person stands on one foot, what will the pressure be under that foot?
2. The surface of water in a water tower storage tank is 50m above the water spout in a bathroom of a house connected to the water tower. If the density of the water remains the same throughout the piping, determine the difference in water pressure between the surface of the water in the tank and the water spout in the bathroom.(see picture)

50m

1. Determine the force exerted by water pressure on a research submarine viewing window using the equation and picture below. The window is a 1m x 1m square, the top edge is 500m below the surface of the water. If 1lb=4.448N, how many lbs of force is the water exerting?

F=0.5ρgL(y22-y12)

y2

y1=500m

1. Consider two identical glasses of water filled to the top. One glass of water has a cookie floating in it, the other has only water. Which glass has the greater weight?
2. Billy, your imaginary pet donkey, with a mass of 1000kg, is stuck at the bottom of a large lake. Billy’s volume is about 4.55x105cm3. If you can calculate how much force is needed to lift Billy from the bottom of the lake then your team of engineers can save Billy. What is the force needed to lift Billy? What is this force in lbs if 1lb=4.448N?

F=?

FB



mg