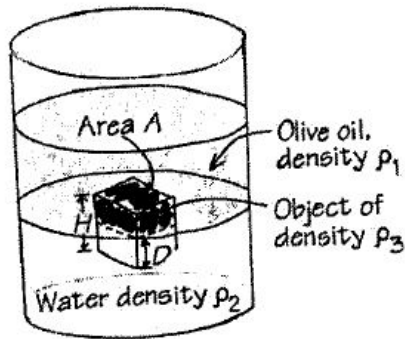


FP21

Olive oil floats on water. Take ρ_1 to be the density of the oil and ρ_2 to be the density of the water. Consider an oil-water interface across which a bouillon cube of density ρ_3 floats, as shown in the figure below.



- a) (3 points) What is the condition on ρ_3 in terms of ρ_1 and ρ_2 such that the cube floats?
- b) (4 points) If the height of the cube is H and the depth of the bottom of the cube below the oil-water interface is D , find D/H in terms of ρ_1 , ρ_2 and ρ_3 .