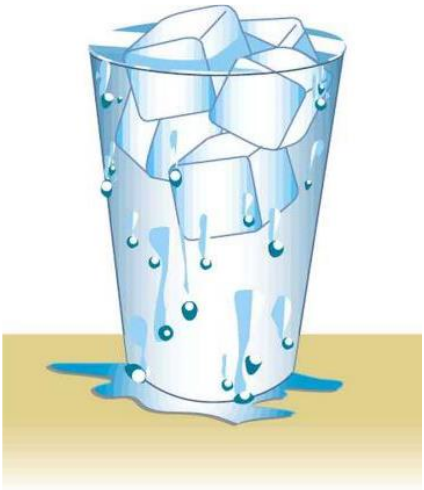
Problem Set 7
Physics, summer 2020/21

1) **(1p.)** Figure shows a glass of ice water filled to the brim. Will the water overflow when the ice melts? Explain your answer.



2) **(2p.)** Calculate the average density of the atmosphere, given that it extends to an altitude of 120 km. Compare this density with that of air equal 1.29 kg/m^3.

3) **(2p.)** Calculate the depth below the surface of water at which the pressure due to the weight of the water equals 1.00 atm.

4) **(2p.)** What force must be exerted on the master cylinder of a hydraulic lift to support the weight of a 2000 kg car (a large car) resting on the slave cylinder? The master cylinder has a 2.00 cm diameter and the slave has a 24.0 cm diameter.

5) **(3p.)** Calculate the contact angle θ for olive oil if capillary action raises it to a height of 7.07 cm in a glass tube with a radius of 0.100 mm. Is this value consistent with that for most organic liquids? (for olive oli take: γ = 0.032 N/m and ρ=0.92 kg/m^3)

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