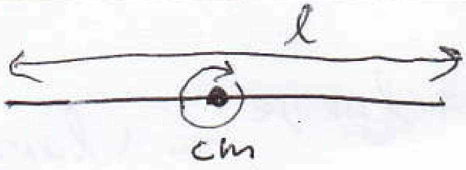
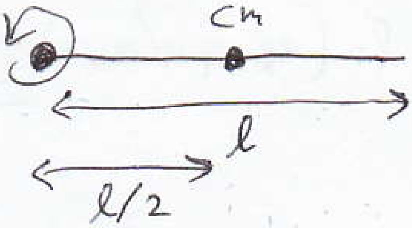




$I_{cm} = \frac{1}{12} M l^2$
(page 268)

For solution to #3 of test 3. →

$I = I_{cm} + M(l/2)^2$

$I = \frac{Ml^2}{12} + \frac{Ml^2}{4}$

$I = \frac{Ml^2}{3}$

Intensive	Extensive
density	volume
color	area
temperature	length
velocity	mass
acceleration	energy
pressure	force
	momentum

Quiz: 4/21

Temperature is <u>not</u> proportional to

A) pressure

B) mass

c) volume

D) average kinetic energy

(Context: ideal gas.)

$PV = nkT$ $\Rightarrow T \propto P$ & $T \propto V$

k ← Boltzmann constant

n ↑ # particles

$\frac{PV}{nk} = T = \frac{2}{3} K_{average} = \frac{2}{3} \cdot \frac{\frac{1}{2}mv_1^2 + \frac{1}{2}mv_2^2 + \cdots}{n}$ (assuming gas monoatomic)

$\Rightarrow T \propto K_{average}$

$T \not\propto m$ is the best answer

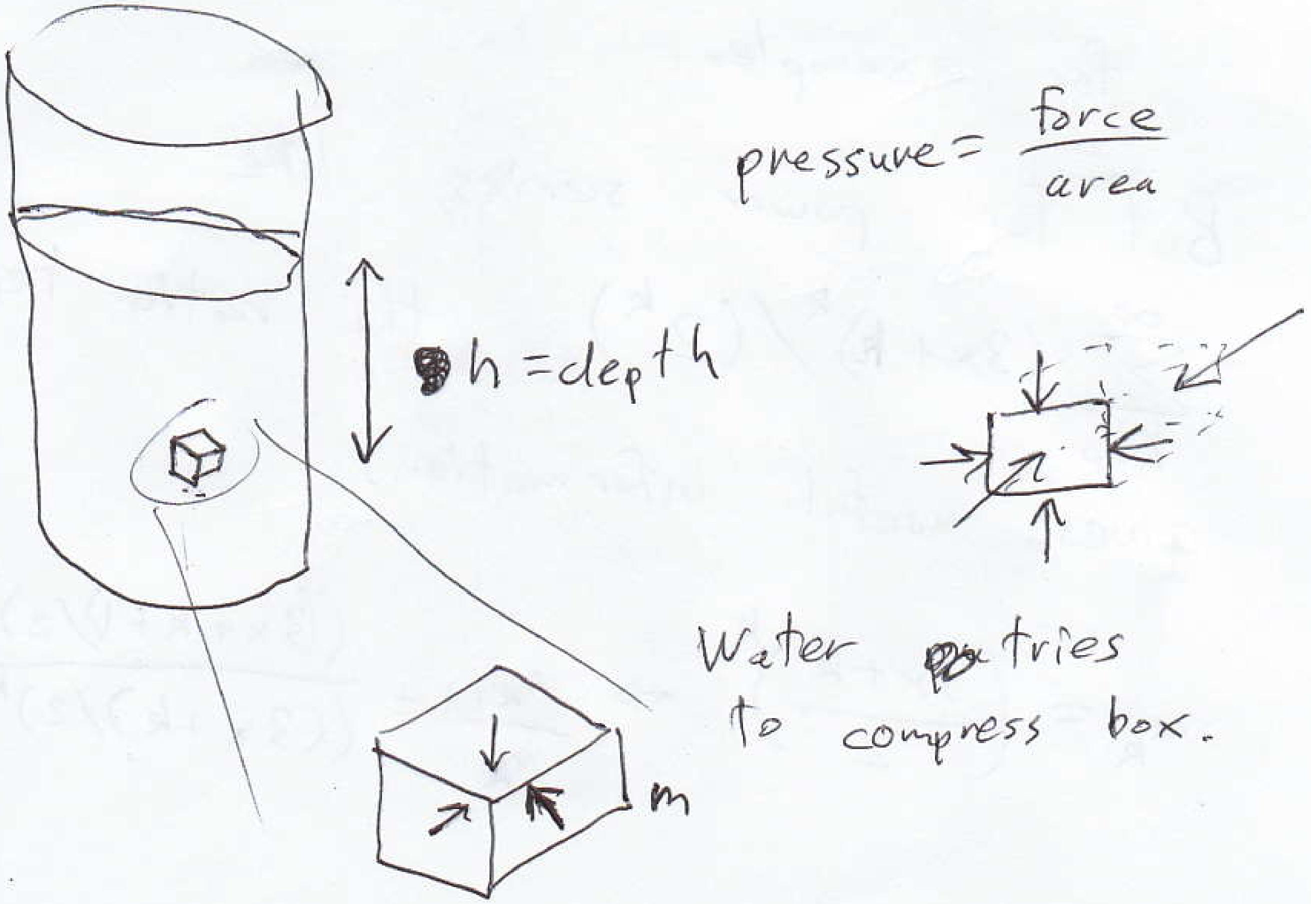
In random motion, K.E. is distributed equally between x, y, z motion and between different particles (on average).

$PV = nkT$ (ideal gas law)

T is measured in Kelvins

Pressure in incompressible Fluids. (liquid/gas)

$\text{pressure} = \frac{\text{force}}{\text{area}}$



Water tries to compress box.

$P = \rho g h$ $\qquad \rho$ = density of fluid

You can also think of this pressure as energy density:

$$P = \frac{\text{force}}{\text{area}} = \frac{\text{force} \cdot \text{length}}{\text{area} \cdot \text{length}} = \frac{\text{energy}}{\text{volume}}$$

$U_g = -mgh$ = gravitational potential energy of little box of H_2O with mass m

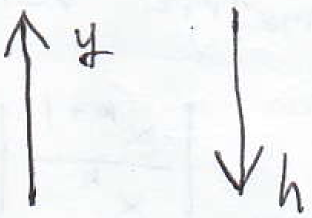
$U_p = mgh$ = fluid potential energy cancelling out gravity

$$P = \frac{U_p}{V} = \frac{m}{V} g h = \rho g h$$

If g is not constant (e.g. in space),

$$dP = -\rho g\, dy$$

$$dP = \rho g\, dh$$



$$\Delta P = \int dP$$

HW: #1 – #6
Read 5.3