NYU Physics I 2018-09-06.

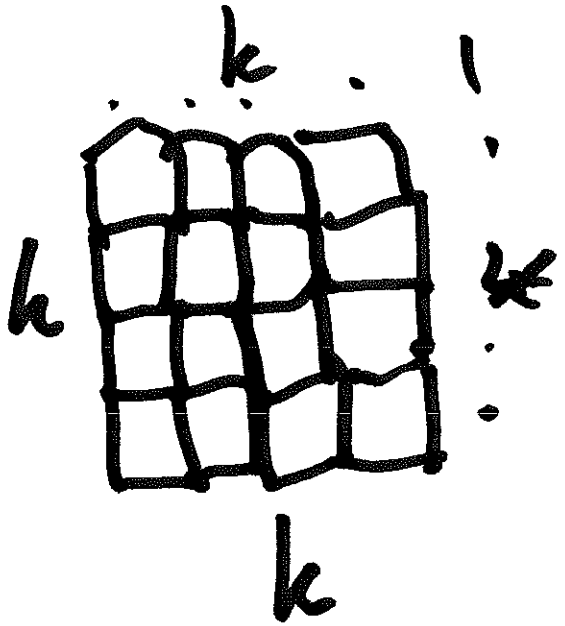
- Questions re: syllabus ?
- Questions ?
- Help, peers, solutions.
- $\sqrt{\frac{h}{g}} \longrightarrow$ huh?
- Mass of the Earth.

"units"

"dimensions"

"motion in one dimension"

http://cosmo.nyu.edu/hogg/physics1



$k+k+1$

"only gravity" mgh

time? time $\sim \sqrt{\frac{h}{g}}$ $\sqrt{\frac{2h}{g}}$

equations!

Mass: A 3 1 million kg 10^6 kg

B 8 1 million million kg 10^{12} kg

C 22 (1 million)^3 kg 10^{18} kg

D 45 (1 million)^4 kg 10^{24} kg

E 1 (1 million)^5 kg. 10^{30} kg

Universal law of gravitation. + a calculator

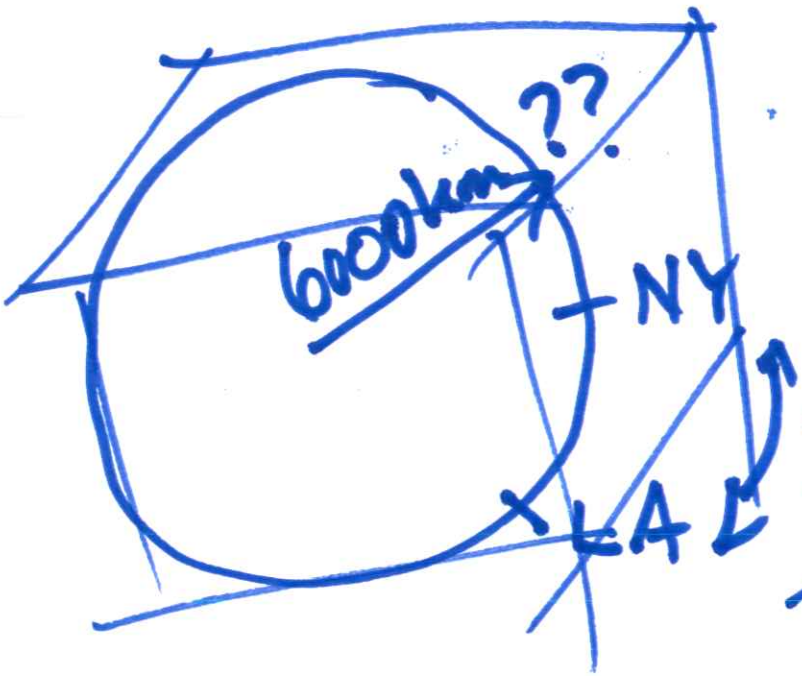
Volume of Earth

M = density × volume.

1 m^3 of ice/water = 10^3 kg

~~$(0.999\ m)^3$~~

rock + metal mix: $5 \times 10^3 \frac{kg}{m^3}$



3000 mi } 24,000 mi

$\sim \frac{1}{8}$

$V = \frac{4}{3}\pi R^3$

$$V = \frac{4}{3}\pi \cdot (6000\ \text{km})^3$$

$$= 4\left(6000\ \text{km} \times \frac{1000\ \text{m}}{1\ \text{km}}\right)^3$$

$$= 4 \times 6^3 \times (10^6)^3\ \text{m}^3 = 800 \times 10^{18}\ \text{m}^3$$

$$V \times \rho = 5 \times 10^3\ \frac{\text{kg}}{\text{m}^3} \times 800 \times 10^{18}\ \text{m}^3$$

$$= 4 \times 10^{24}\ \text{kg}$$