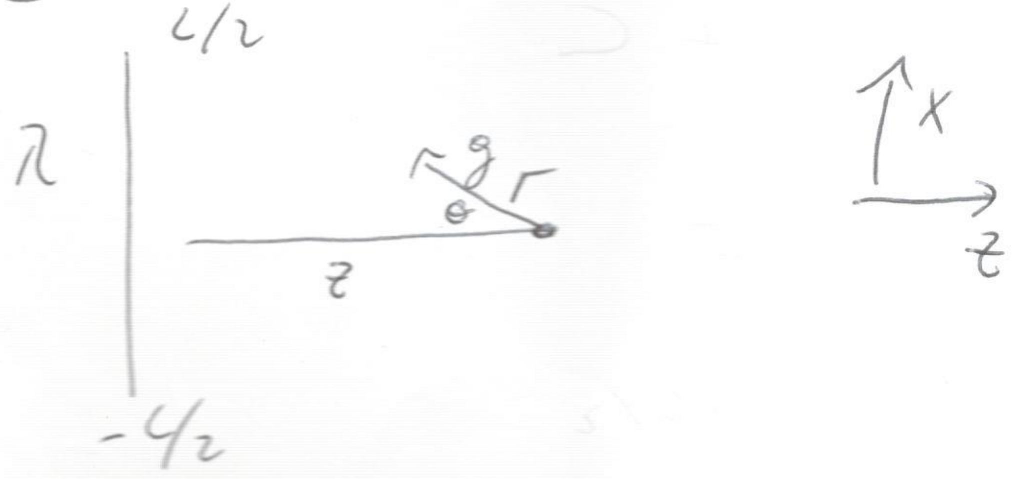
P1]



$$\vec{g}_z = \vec{g}\cdot\hat{z} = |\vec{g}_z| = \int_{-L/2}^{L/2} \cos(\theta)\, dg$$

$$= \int_{-L/2}^{L/2} \frac{G\cos(\theta)\, dm}{r^2} \longrightarrow \lambda\, dx \qquad \cos(\theta) = \frac{z}{r}$$

$$= \int_{-L/2}^{L/2} G\cdot\frac{\lambda\cdot dx}{r^2}\cdot\frac{z}{r} \qquad ;\ r^2 = x^2 + z^2$$

$$= \int_{-L/2}^{L/2} \frac{G\cdot z\cdot\lambda\cdot dx}{(x^2+z^2)^{3/2}} \qquad ;\ C.V \Rightarrow x = z\, Tg(\theta)$$

$$dx = z\cdot\sec^2\theta\, d\theta$$

$$= \int \frac{G\cdot\lambda\cdot z^2\cdot\sec^2 d\theta}{z^3\cdot\sec^3(\theta)}$$

$$= \int G \lambda \cdot z \cdot \cos\theta \, d\theta$$

$$= G \lambda \cdot z \cdot \sin\theta + C$$

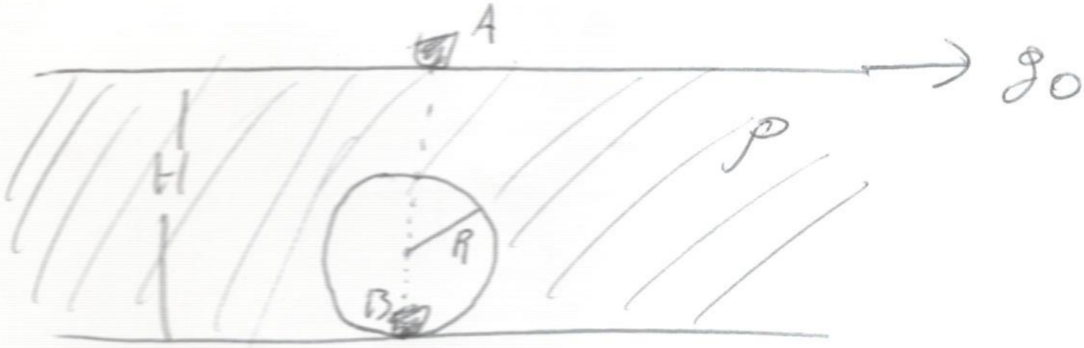
pero $\sin\theta = \frac{x}{r}$

$$\Rightarrow G \cdot \lambda \cdot z \cdot \frac{x}{(x^2+z^2)^{1/2}} \Big|_{-L/2}^{L/2}$$

$$\Rightarrow g_z = \frac{G\lambda \cdot z \cdot L}{\sqrt{(L/2)^2 + z^2}}$$

P2

a)



$$g_A = g_0 + 2\pi\rho G H - \frac{G\rho}{(H-R)^2} \cdot \frac{4}{3}\pi R^3$$

$$g_B = g_0 + \gamma \cdot H - 2\pi G \rho \cdot H + \frac{G\rho}{R^2} \cdot \frac{4}{3}\pi R^3$$

$$\Delta g = g_B - g_A = \gamma H - 4\pi\rho G H + G\rho \frac{4\pi}{3} R^3 \left[\frac{1}{R^2} + \frac{1}{(H-R)^2}\right] =$$

$$= \gamma H - 4\pi\rho G H + 4\pi\rho G H \cdot \underbrace{\frac{R}{3H}\left[1 + \left(\frac{R}{H-R}\right)^2\right]}_{A}$$

B)

$$\Rightarrow \rho = \frac{\gamma H - \Delta g}{4\pi G H(1-A)}$$

P3]

a) ~4 Km : ~~tectora~~

b) -89°C, 58°C, 13°C respectivamente

c) Relación empírica entre radios orbitales de los planetas del sistema solar y una sucesión aritmética-geométrica con el nº de objetos

D) ~40%

e) Europa, satélite de Júpiter

f) Distancia entre elipsoide y geoide terrestre

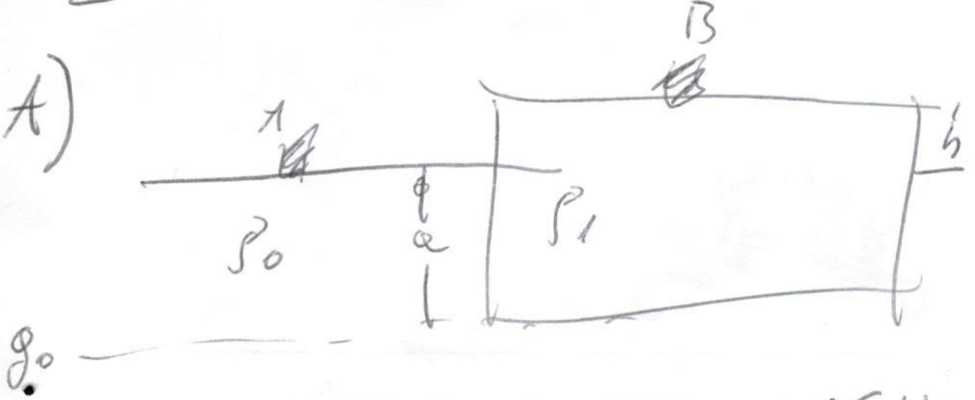
g) Distancia entre elipsoide y superficie real de la tierra

h) Corrige por la dif de altura entre el pto de medida y el datum

i) $\simeq 0$

P1

A)



i) $g_A = g_0 + 2\pi \rho_0 G \cdot a \; \cancel{+} \; \underbrace{\gamma H}_{\left(\frac{2G \cdot M}{r^3}\right) \cdot H}$

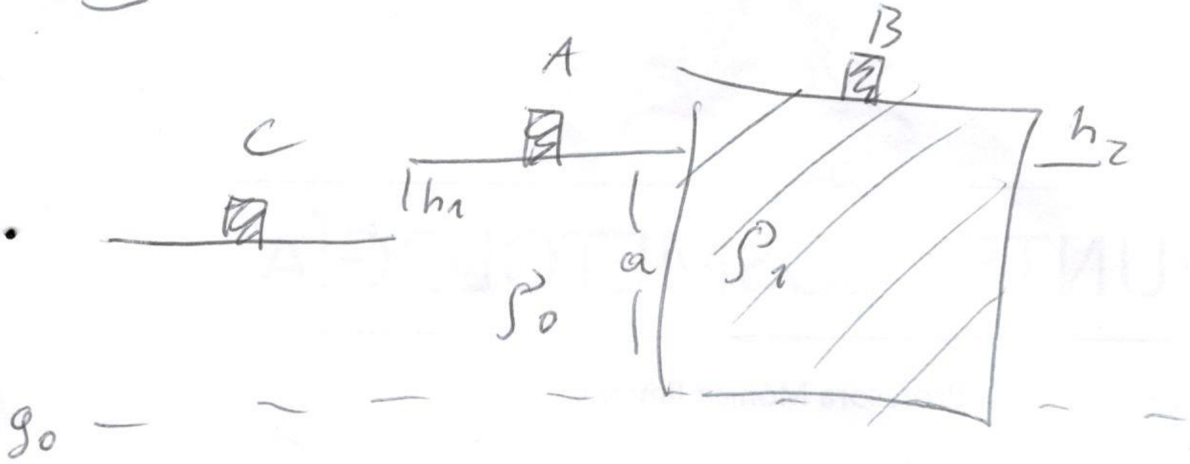
$g_b = g_0 + 2\pi \rho_1 G \cdot (a+h) - \gamma \cdot (a+H)$

$(g_b - g_A) = 2\pi \rho_1 G(a+h) - 2\pi \rho_0 G \cdot a - \gamma a$ //

ii) $\cancel{2\pi} \rho_1 \cancel{G}(a+h) = \cancel{2\pi} \rho_0 \cancel{G} \cdot a$

$\rho_1 = \frac{\rho_0 a}{a+h}$ / ISOSTACIA

P2]



$$g_A = g_0 + 2\pi G \rho_0 \cdot a - \gamma \cdot a$$

$$g_C = g_0 + 2\pi G \rho_0 (a-h) - \gamma (a-h)$$

$$g_B = g_0 + 2\pi G \rho_1 (a+h_2) + \gamma (a+h_2)$$

P3]