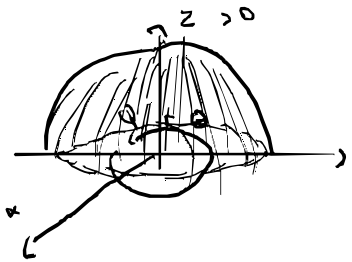
4)



$(x,y,z) = (a\sin\theta\cos\varphi,\ a\sin\theta\sin\varphi,\ a\cos\theta)$

$M = \iint \rho \cdot dS \longrightarrow = a^2 \sin\theta \, d\theta \, d\varphi$

$$= \int_0^{2\pi} \int_0^{\pi/2} k \cdot z \cdot a^2 \sin\theta \, d\theta \, d\varphi$$

$$= k \cdot a^3 \cdot \pi$$

("a")

Eenmaligheid met hoogte boven het x-y vlak:

$M_x = 0$, $M_y = 0$, $M_z = \frac{1}{M} \cdot \int_0^{2\pi} \int_0^{\pi/2} k \cdot z \cdot a\cos\theta \cdot a^2 \sin\theta \, d\theta \, d\varphi$

$$= \frac{2a}{3}$$