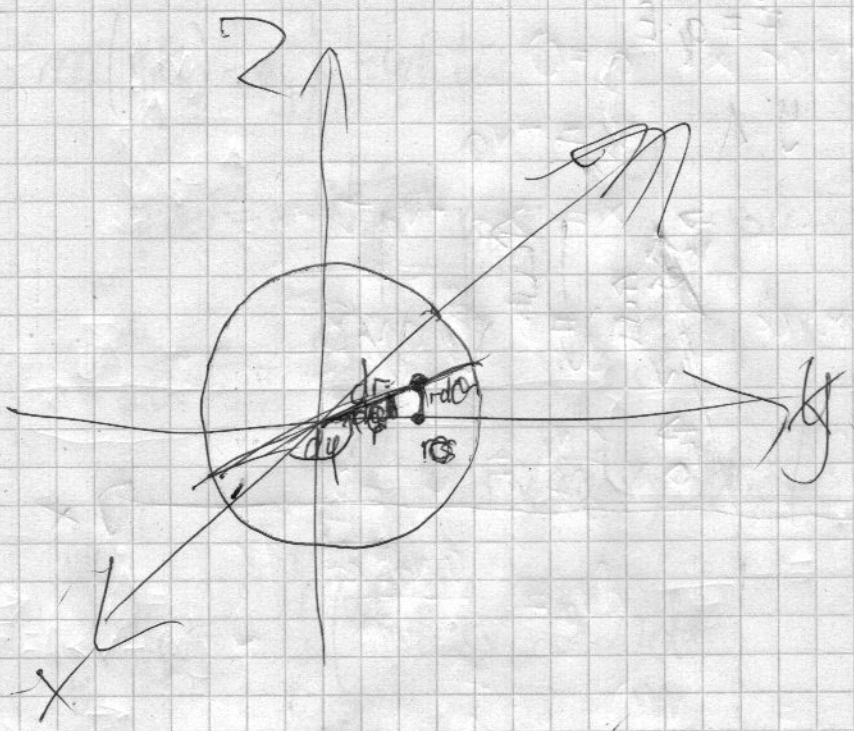

$$dV = dr \cdot r d\Theta$$

$$m = \int_0^{\pi}\int_0^{2\pi}\int_0^{R} \rho r^2 \sin\Theta \, dr \, d\varphi \, d\Theta$$

$$m = \int_0^{\pi}\int_0^{2\pi}\int_0^{R} \rho_0 \frac{r^3}{R}(1-\cos\Theta)\sin\Theta \, dr \, d\varphi \, d\Theta$$

$$m = \frac{\rho_0}{R} \cdot \int_0^{\pi}\int_0^{2\pi} (1-\cos\Theta)\sin\Theta \left[\frac{1}{4} r^4\right]_0^R d\varphi \, d\Theta$$

$$m = \frac{\rho_0 R^3}{4} \int_0^{\pi}\int_0^{2\pi} (1-\cos\Theta)\sin\Theta \, d\varphi \, d\Theta =$$

$$m = \frac{1}{2}\rho_0 R^3 \pi \int_0^{\pi} (1-\cos\Theta)\sin\Theta \, d\Theta =$$

$$= \frac{1}{2}\rho_0 R^3 \pi \left(\int_0^{\pi} \sin\Theta \, d\Theta - \frac{1}{2}\int \sin 2\Theta \, d\Theta \right) =$$

$$= \frac{1}{2}\rho_0 R^3 \pi \left(\left[-\cos\Theta\right]_0^{\pi} + \frac{1}{4}\left[\cos 2\Theta\right]_0^{\pi} \right) =$$

$$= \frac{1}{2}\rho_0 R^3 \pi \left(2 + \frac{1}{4} \cdot 0 \right) = \rho_0 \pi R^3$$