

$$\int_0^1 \int_x^1 dy dx = \int_0^1 \int_0^y \sin y^2 dx dy$$

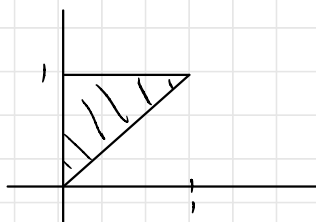
$$= \int_0^1 x \sin y^2 \Big|_0^y dy$$

$$= \int_0^1 y \sin y^2 dy$$

$$\text{let } y^2 = t$$

$$2y dy = dt$$

$$= \int_0^1 \sin t \frac{dt}{2} \dots$$



$$\int_0^{2\pi} \int_0^\pi \int_0^\pi \int_0^R r^3 \sin^2 \theta_1 \sin \theta_2 dr d\theta_1 d\theta_2 d\theta_3$$

$$= \frac{r^4}{4} \Big|_0^R \cdot (-\cos \theta_2) \Big|_0^\pi \cdot \int_0^\pi \sin^2 \theta_1 d\theta_1 \cdot 2\pi$$

$$= \frac{R^4}{4} \cdot 2 \cdot \frac{\pi}{2} \cdot 2\pi = \frac{\pi^2}{2} R^4$$