

$$\int_V z^2 + \cos x \, dV \quad 0 \leq z \leq x^2 + y^2 \leq 1$$

$$\int_V z^2 + \cos x \, dV = \int_V z^2 \, dV + \int_V \cos x \, dV \quad = 0$$

$$\int_V z^2 \, dV = \int_0^1 z^2 \int_0^{2\pi} \int_{\sqrt{z}}^1 \rho \, d\rho \, d\theta \, dz =$$

$$= 2\pi \int_0^1 z^2 \left[\frac{\rho^2}{2} \right]_{\sqrt{z}}^1 dz = \pi \int_0^1 z^2 (1-z) dz =$$

$$= \pi \left[\frac{z^3}{3} - \frac{z^5}{5} \right]_0^1 = \pi \left(\frac{1}{3} - \frac{1}{5} \right) = \frac{\pi}{12}$$

