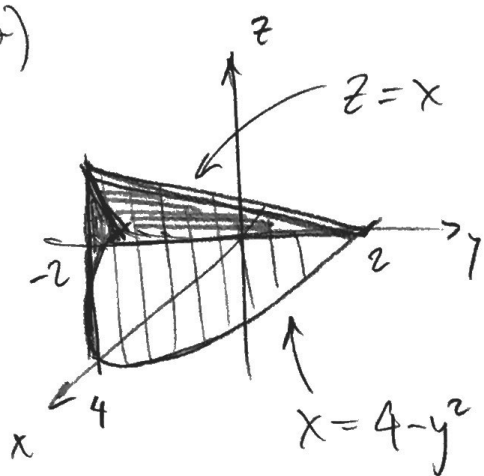


a)



$$Vol(R) = \iiint dV$$

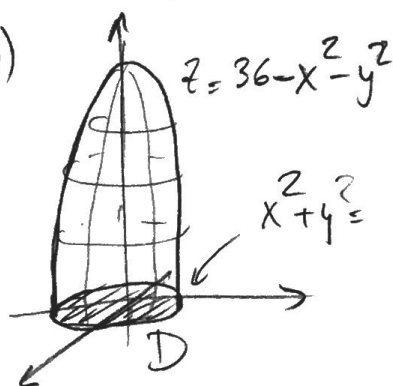
$$= \int_{-2}^2 \int_0^{4-y^2} \int_0^x dz dx dy$$

$$= \int_{-2}^2 \int_0^{4-y^2} x dx dy =$$

$$= \int_{-2}^2 \left. \frac{x^2}{2} \right|_0^{4-y^2} dy = \int_{-2}^2 \frac{(4-y^2)^2}{2} dy = \frac{1}{2} \int_{-2}^2 (16 - 8y^2 + y^4) dy$$

$$= \left. 8y \right|_{-2}^2 - \left. \frac{4y^3}{3} \right|_{-2}^2 + \left. \frac{y^5}{10} \right|_{-2}^2 = 32 - \frac{4}{3} \cdot 16 + \frac{32}{5} = \boxed{\frac{256}{15}}$$

b)



$$Vol(R) = \iiint_R dV = \iint_D \left( \int_0^{36-x^2-y^2} dz \right) dA$$

$$= \iint_D 36 - x^2 - y^2 dA = \int_0^{2\pi} \int_0^6 (36 - r^2) r dr d\theta$$

$$= 2\pi \int_0^6 (36r - r^3) dr = 2\pi \left( 18r^2 - \frac{r^4}{4} \right) \Big|_0^6 =$$

$$= 2\pi (648 - 324) = \boxed{648\pi}$$