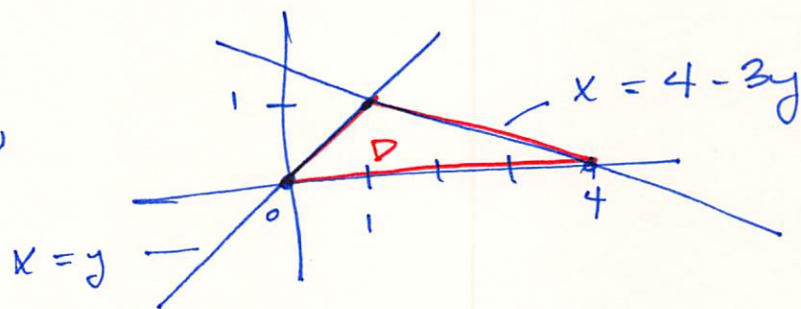


#22.

$$\iint_D y \, dA,$$



$$= \int_0^1 \int_y^{4-3y} y \, dx \, dy$$

$$= \int_0^1 y x \Big|_y^{4-3y} \, dy$$

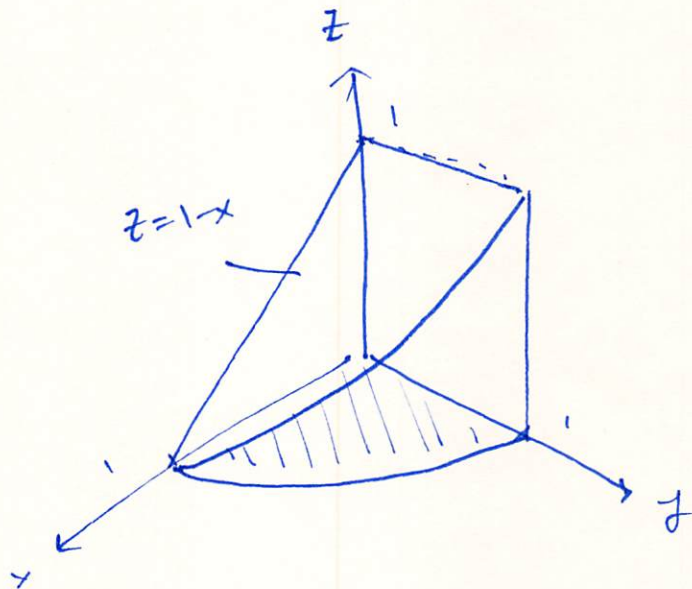
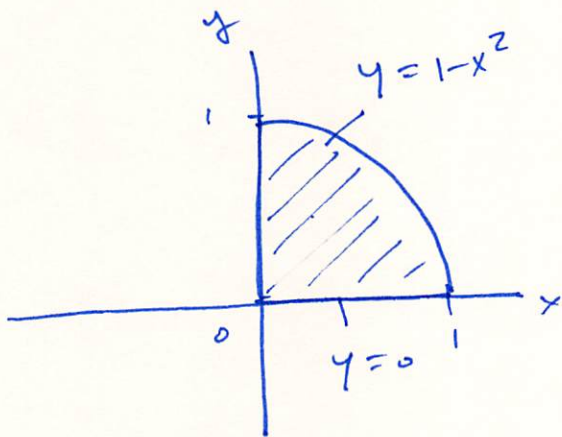
$$= \int_0^1 y [4-3y - y] \, dy$$

$$= \int_0^1 4y - 4y^2 \, dy$$

$$= 2y^2 - \frac{4}{3}y^3 \Big|_0^1$$

$$= 2 - \frac{4}{3} = \frac{2}{3}$$

#40. $\int_0^1 \int_0^{1-x^2} 1-x \, dy \, dx$



#46. $\int_0^2 \int_{x^2}^4 f(x,y) dy dx$

as type I

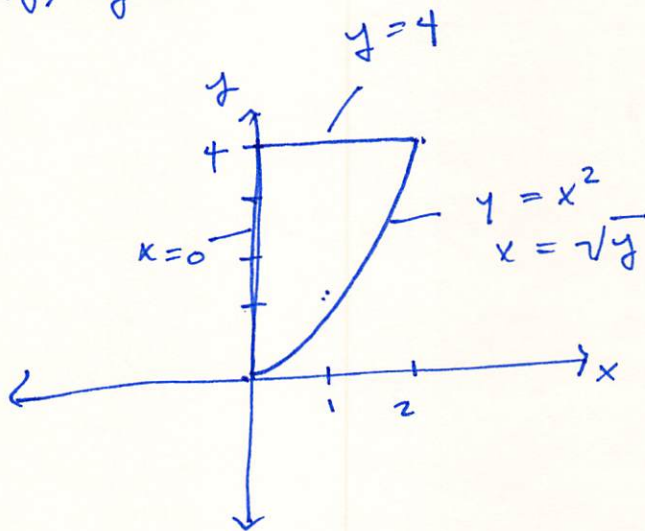
$$0 \leq x \leq 2$$

$$x^2 \leq y \leq 4$$

as type II

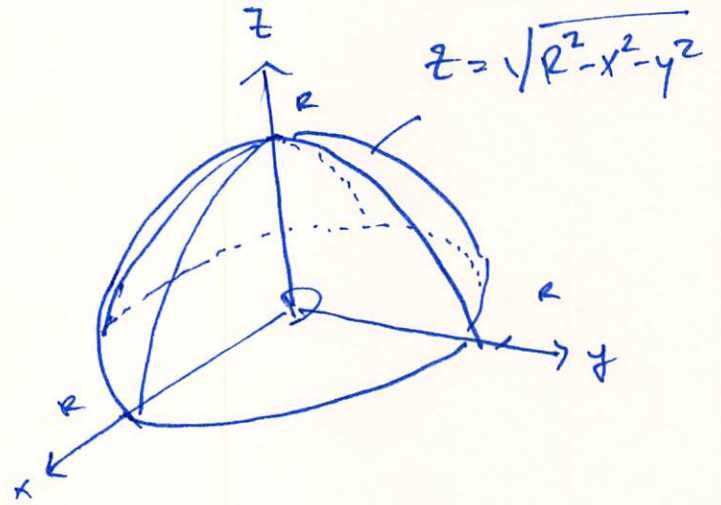
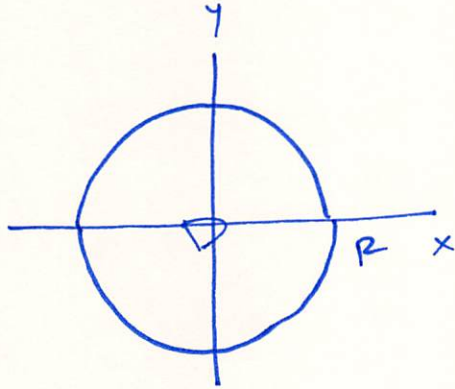
$$0 \leq y \leq 4$$

$$0 \leq x \leq \sqrt{y}$$



$$D = \int_0^4 \int_0^{\sqrt{y}} f(x,y) dx dy$$

#66.



$$\int_0^{\sqrt{R^2 - x^2 - y^2}} \sqrt{R^2 - x^2 - y^2} = \text{Volume of half a ball of radius } R$$

$$= \frac{1}{2} \cdot \frac{4}{3} \pi R^3$$

$$= \frac{2\pi R^3}{3}$$