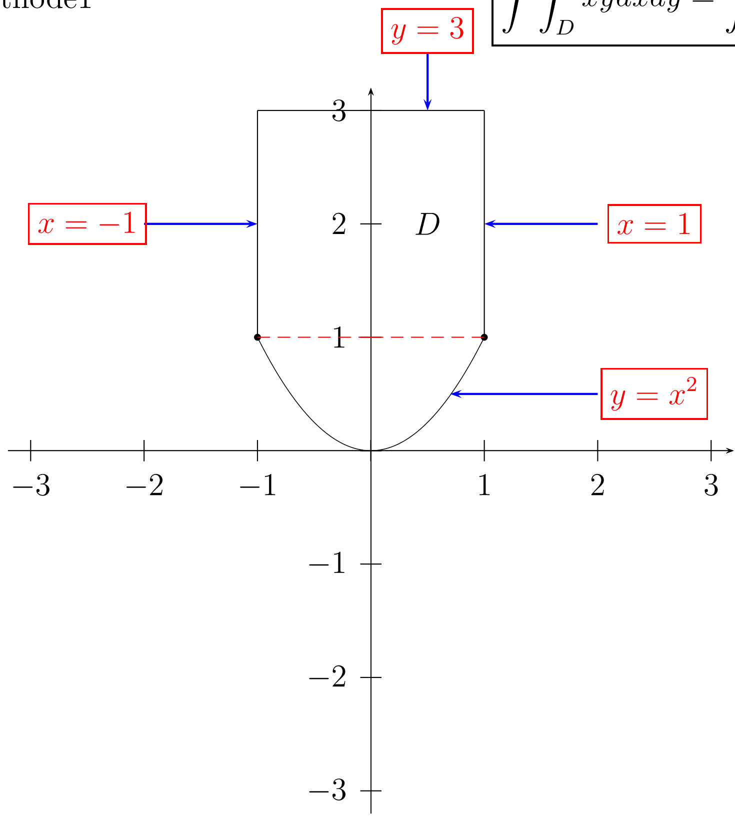
Exercise2 (Schémas)

Méthode1

$$\int\int_D xydxdy = \int_{-1}^{1}\left[\int_{x^2}^{3} xydy\right]dx$$



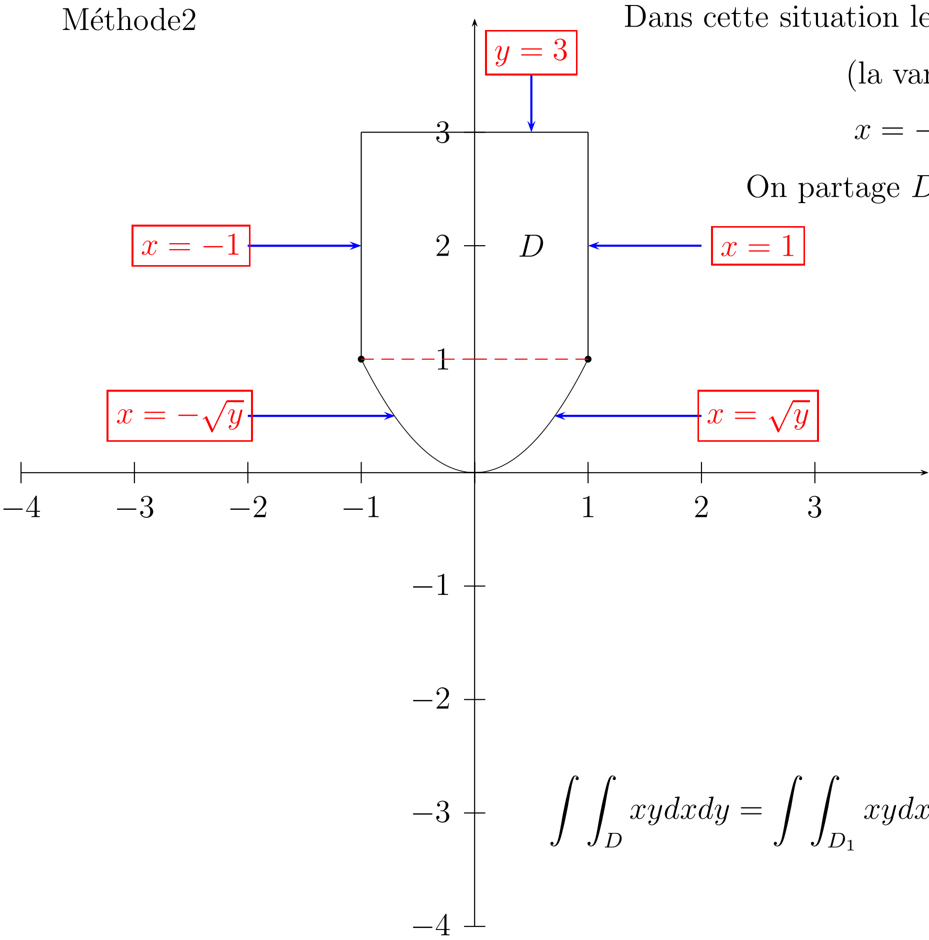
Méthode2

Dans cette situation le domaine D n'est pas régulier.

(la variable x possède 4 bornnes à savoir :

$x = -1,\ x = 1,\ x = \sqrt{y}$ et $x = \sqrt{y}$)

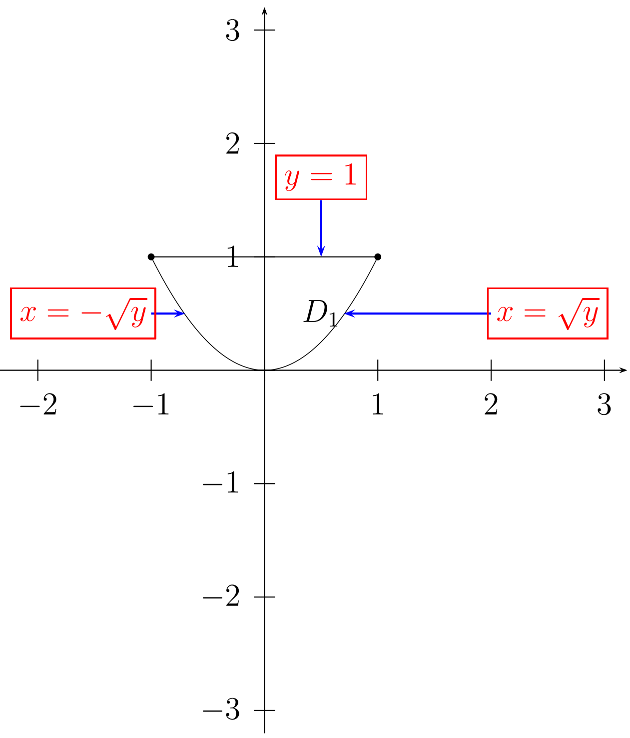
On partage D en deux domaines réguliers D_1 et D_2

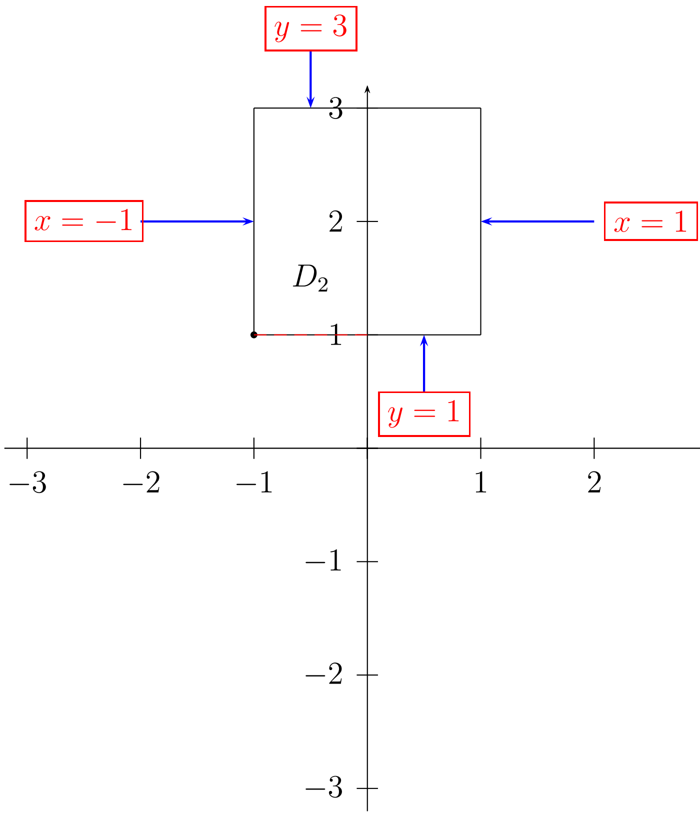


$$\int\int_D xydxdy = \int\int_{D_1} xydxdy + \int\int_{D_2} xydxdy$$

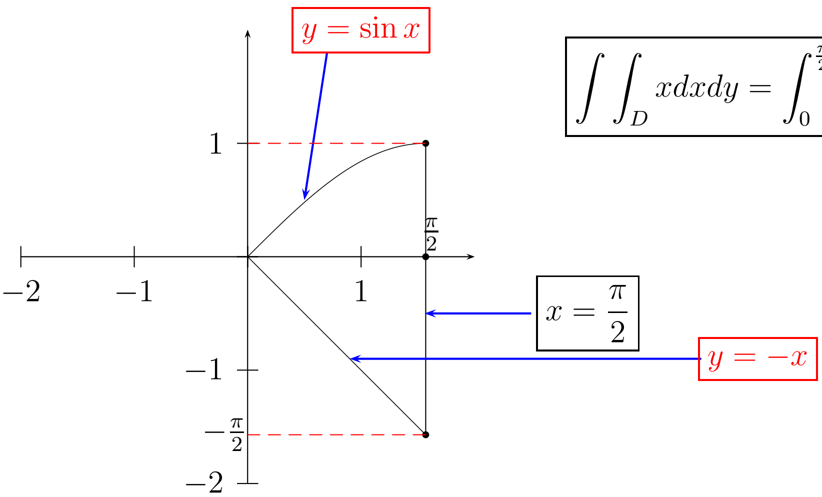
$$\int\int_{D_1} xydxdy = \int_0^1 \left[\int_{-\sqrt{y}}^{\sqrt{y}} xydx\right] dy$$

$$\int\int_{D_2} xydxdy = \int_1^3 \left[\int_{-1}^{1} xydx\right] dy$$





Méthode1

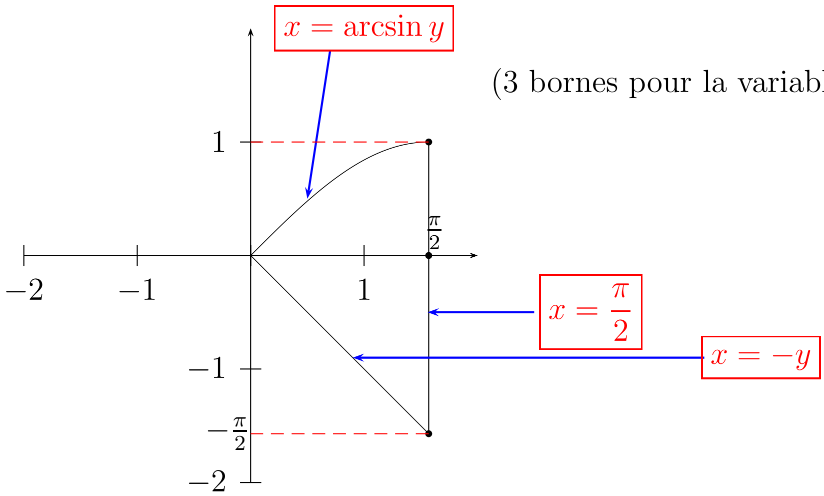


$$\int\int_{D} xdxdy = \int_0^{\frac{\pi}{2}} \left[\int_{-x}^{\sin x} xdy\right] dx$$

Méthode 2

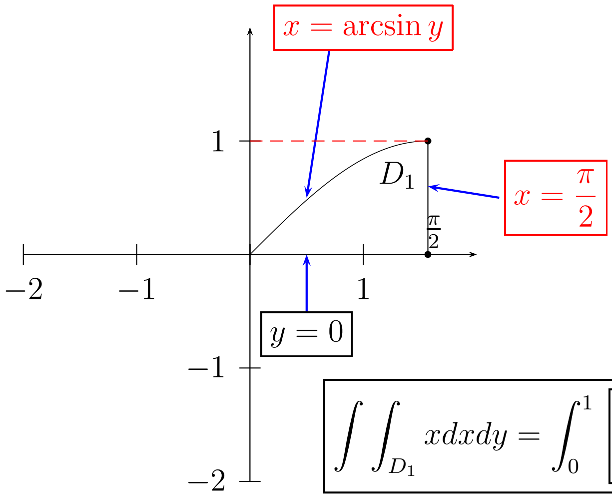
Concèrnant la méthode2, le domaine D n'est pas régulier.

(3 bornes pour la variable x à savoir $\frac{\pi}{2}$, $-y$ et $\arcsin y$).

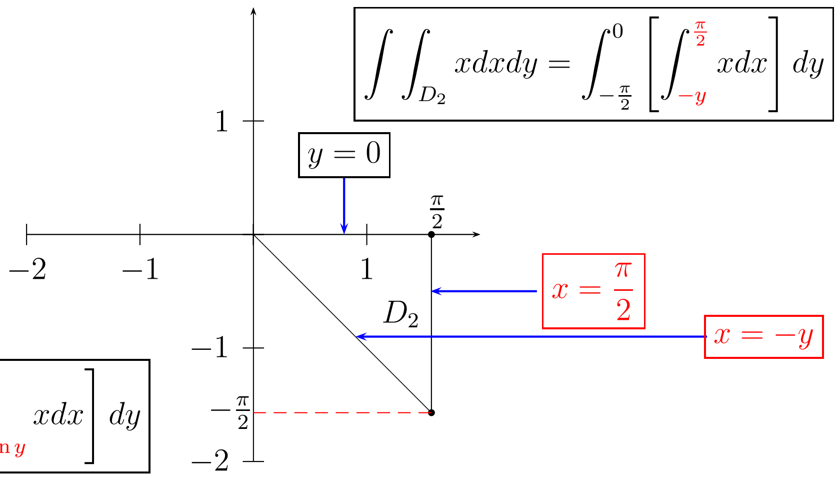


Par conséquent, on partage le domaine D en deux domaines réguliers D_1 et D_2.

$$\int\int_D x dx dy = \int\int_{D_1} x dx dy + \int\int_{D_2} x dx dy$$



$$\int\int_{D_1} x dx dy = \int_0^1 \left[\int_{\arcsin y}^{\frac{\pi}{2}} x dx\right] dy$$



$$\int\int_{D_2} x dx dy = \int_{-\frac{\pi}{2}}^{0} \left[\int_{-y}^{\frac{\pi}{2}} x dx\right] dy$$