

問 次の領域を図示せよ.

(1)  $D = \{ 0 \leq x \leq 1, x^2 \leq y \leq \sqrt{x} \}$

(2)  $D = \{ y \geq 2x, x^2 + y^2 \leq 1, x \geq 0 \}$

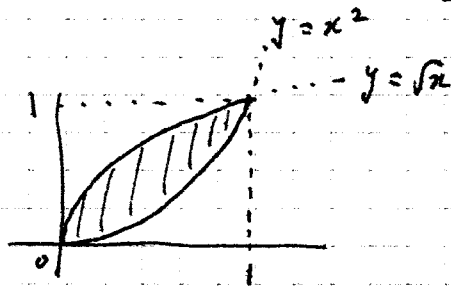
(3)  $D = \{ y^2 \leq x \leq y+2 \}$

(4)  $D = \{ x \geq 0, 3x-3 \leq y \leq -2x+2 \}$

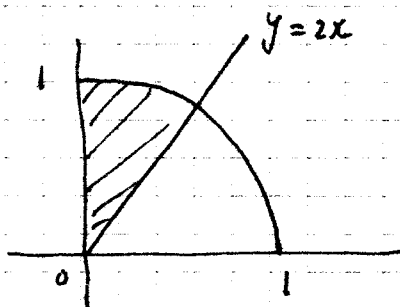
(5)  $D = \{ |x| + |y| \leq 1 \}$

答

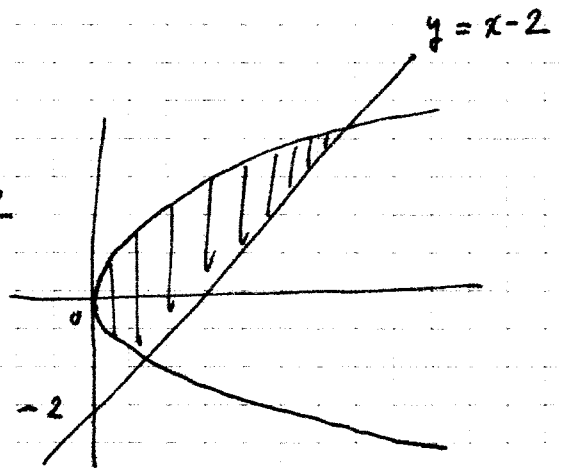
(1)



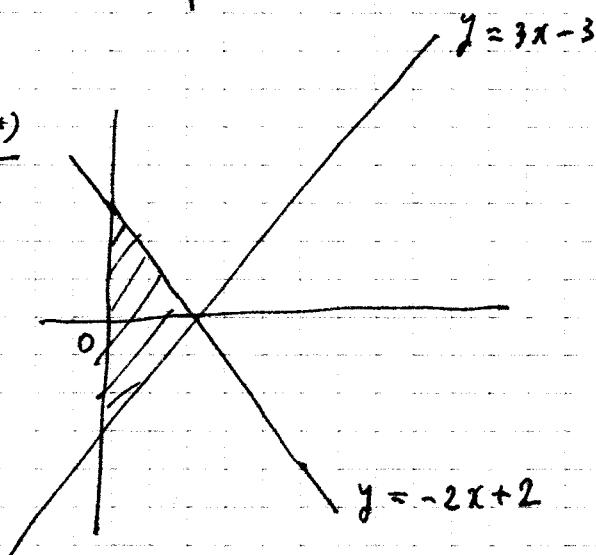
(2)



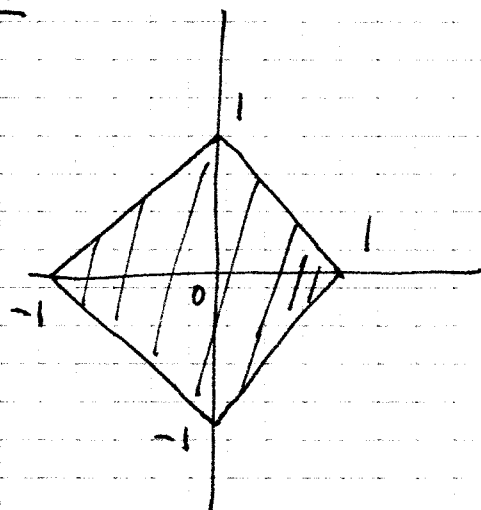
(3)



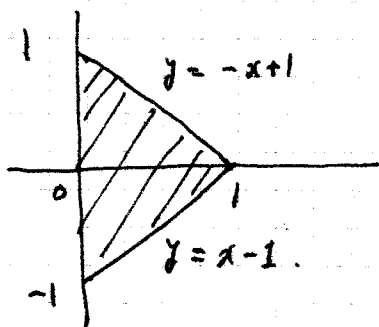
(4)



(5)



$$\underline{157} \quad \iint_D x^2 y \, dx dy, \quad D = \{ 0 \leq x \leq 1, \quad x-1 \leq y \leq -x+1 \}$$



答  $y, x$  の順に累次積分.

$$\iint_D x^2 y \, dx dy = \int_0^1 \left( \int_{x-1}^{-x+1} x^2 y \, dy \right) dx$$

$$= \int_0^1 \left[ \frac{x^2 y^2}{2} \right]_{x-1}^{-x+1} dx$$

$$= \int_0^1 \underbrace{\frac{x^2(-x+1)^2}{2} - \frac{x^2(x-1)^2}{2}}_0 dx = 0.$$