[ ] 内はヒントや注意.

§5.3

(A)

1. (1) $D=\{(x,y)\,|\,0\leqq y\leqq 1-x,\ 0\leqq x\leqq 1\},\ \varphi_1=0,\ \varphi_2=x$
(2) $D=\{(x,y)\,|\,0\leqq x\leqq y\leqq 1\},\ \varphi_1=0,\ \varphi_2=x+y$
(3) $D=\{(x,y)\,|\,x^2+y^2\leqq 1\},\ \varphi_1=0,\ \varphi_2=1-x^2-y^2$
2. (1) $D=\{(y,z)\,|\,0\leqq y\leqq 1-z,\ 0\leqq z\leqq 1\},\ \psi_1=0,\ \psi_2=1-y-z$
(2) 削除
(3) $D=\{(y,z)\,|\,|y|+|z|\leqq 1\},\ \psi_1=-1+(|y|+|z|),\ \psi_2=1-(|y|+|z|)$
3. (1) $D=\{(x,y)\,|\,1-x\leqq y\leqq 1,\ 0\leqq x\leqq 1\},\ \varphi_1=0,\ \varphi_2=x+y-1$
(2) $D=\{(x,y)\,|\,x^2+y^2\leqq 1,\ x,y\geqq 0\},\ \varphi_1=0,\ \varphi_2=\sqrt{1-x^2-y^2}$
(3) $D=\{(x,y)\,|\,-\sqrt{x^2-x}\leqq y\leqq \sqrt{x^2-x}\},\ \varphi_1=0,\ \varphi_2=\sqrt{1-x^2-y^2}$
4. (1) ~~1/14~~ 1/24 (2) 3/8 (3) 0 [被積分関数は x について奇関数]
5. (1) $(1/2)(\log 2-5/8)$ (2) 1/120 [$\int_0^1 x(1-x)^3dx=\int_0^1(1-t)t^3dt.$]
(3) 2/15
6. (1) $\pi/16$ [§5.4 の問題と考えた方が易しい]
(2) $5\pi/64$ [§5.4 の問題と考えた方が易しい]

(B)

1. [一般化した次の問題にチャレンジせよ。

$$\int_0^x dx_n\int_0^{x_n} dx_{n-1}\cdots\int_0^{x_1} f(t)\,dt=\frac{1}{n!}\int_0^x (x-t)^n f(t)\,dt$$

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