

12.7 | 연습문제 정답

01. $y = x$ ($0 \leq x \leq 2$), $y = -x + 4$ ($0 \leq x \leq 2$), $y = x + 4$ ($-2 \leq x \leq 0$),
 $y = -x$ ($-2 \leq x \leq 0$)으로 둘러싸인 영역

02. (a) $\frac{\partial(x,y)}{\partial(u,v)} = \begin{vmatrix} 1 & 2 \\ 1 & -4 \end{vmatrix} = -6$

(b) $\frac{\partial(x,y)}{\partial(u,v)} = \begin{vmatrix} \sin v & u \cos v \\ \cos v & -u \sin v \end{vmatrix} = -u$

03. $4 \ln \sqrt{3}$

04. (a) π (b) 0

05. (a) $\frac{14}{3}$ (b) 2

06. $\frac{\pi^2}{8}$

07. $\frac{1}{3} \ln(\sqrt{2} + 1)$

08. $\frac{1}{3} + \frac{1}{12}(\sin 6 - \sin 2)$

09. $\frac{3}{2} \sin 1$

10. $e^{16} - 1$

11. $\frac{4\ln 4 - 3}{4}\pi$

12. $\frac{2}{15}\left(e - \frac{1}{e^2}\right)(7\sqrt{7} - 1).$

13. (a) $\int_0^{2\pi} \int_0^\pi \int_0^1 abc \rho^2 \sin \phi d\rho d\phi d\theta = \frac{4abc}{3}\pi$

(b) $8 \int_0^{\frac{\pi}{2}} \int_0^{\frac{\pi}{2}} \int_0^1 (abc)^2 \rho^5 \sin^3 \phi \cos^2 \phi \cos \theta \sin \theta d\rho d\phi d\theta = \frac{4(abc)^2}{45}$

14. $\frac{4}{15}abc\pi\delta(a^2 + b^2)$

15. 생략