

数学基礎演習 C5.4(b)

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$$\begin{aligned} \iint_A \sqrt{x+y} \, dx \, dy \quad (A: 0 \leq x \leq a, 0 \leq y \leq b) \\ &= \int_0^a \left(\int_0^b \sqrt{x+y} \, dy \right) dx \\ &= \frac{2}{3} \int_0^a \left[(x+y)^{\frac{3}{2}} \right]_0^b dx \\ &= \frac{2}{3} \int_0^a \left\{ (x+b)^{\frac{3}{2}} - x^{\frac{3}{2}} \right\} dx \\ &= \frac{2}{3} \left[\frac{2}{5} \left\{ (x+b)^{\frac{5}{2}} - x^{\frac{5}{2}} \right\} \right]_0^a \\ &= \frac{4}{15} \left\{ (a+b)^{\frac{5}{2}} - a^{\frac{5}{2}} - b^{\frac{5}{2}} \right\} \end{aligned}$$