

Multiple Integration
Iteration of Double Integrals

Question

Calculate the given iterated integral.

$$\int_0^1 \int_0^y (xy + y^2) dx dy$$

Answer

$$\begin{aligned} & \int_0^1 \int_0^y (xy + y^2) dx dy \\ &= \int_0^1 +0^1 \left(\frac{x^2 y}{2} + xy^2 \right) \Big|_{x=0}^{x=y} dy \\ &= \frac{3}{2} \int_0^1 y^3 dy = \frac{3}{8} \end{aligned}$$