

16.2 and 16.3: Iterated Integrals

Calculus III

College of the Atlantic

1. Let R be a triangular region with corners at $(1, 1)$, $(3, 4)$, and $(1, 4)$. Write

$$\int_R x^2 y^3 dA, \quad (1)$$

as an iterated integral in two different ways.

2. Let R be the triangular region with corners at $(0, 3)$, $(1, 1)$, and $(5, 3)$. Write the integral

$$\int_R 3xy^2 dA, \quad (2)$$

as an iterated integral and sketch the region of integration.

3. Let R be a circle of radius 2 centered at the origin. Write

$$\int_R xy dA, \quad (3)$$

as an iterated integral.

4. Let R be the region bounded by $y = \sqrt{x}$ and $y = x^3$. Evaluate

$$\int_R 4xy - y^3 dA, \quad (4)$$

and sketch the region of integration.

5. Evaluate the integral and sketch the region of integration

$$\int_1^2 \int_0^2 \int_0^1 \rho(x, y, z) dx dz dy, \quad (5)$$

where $\rho(x, y, z) = z + x$.