15.1-2: Double Integrals

Friday, March 18

Integrals over General Regions

Find the integral of the function $f(x, y) = xy^2$ over the triangle with vertices at $(0, 0), (0, 1)$, and $(1, 0)$ at least two different ways.

Find the volume of the solid under the surface $z = xy$ and above the triangle with vertices $(1, 1), (4, 1), (2, 2)$.

Evaluate the integral $\int_0^1 \int_{3y}^3 e^{x^2}\, dx\, dy$ by reversing the order of integration.

Polar Coordinates

Evaluate the integral $\iint_D e^{-x^2-y^2}\,dA$, where D is the region bounded by the semicircle $x = \sqrt{4-y^2}$ and the y-axis.

Find the volume of the solid inside the sphere $x^2 + y^2 + z^2 = 16$ and outside the cylinder $x^2 + y^2 = 4$.