

1. Use a triple integral to find the volume of the tetrahedron T bounded by the planes $x + 2y + z = 2$, $x = 2y$, $x = 0$, and $z = 0$.

2. Express the integral

$$\int \int \int_T f(x, y, z) dV$$

as an iterated integral in six different ways, where T is the solid bounded by the given surfaces:

a. $z = 0$, $x = 0$, $y = 2$, $z = y - 2x$

b. $9x^2 + 4y^2 + z^2 = 1$

3. Evaluate

$$\int \int \int_T \sqrt{x^2 + z^2} dV$$

where T is the region bounded by the paraboloid $y = x^2 + z^2$ and the plane $y = 4$.

4. Evaluate

$$\int \int \int_T x + 2y dV$$

where T is the region bounded by the parabolic cylinder $y = x^2$ and the planes $x = z$, $x = y$, and $z = 0$.