

Analytic Geometry and Calculus III (22005 Section 002)
Home work 8, due Wednesday, November 9
Instructor: Prof. Artem Zvavitch

Problem 1. Evaluate the following integrals

- $\int_0^1 \int_{-z}^z \int_{x-z}^{x+z} xyz dy dx dz$
- $\int \int \int_E x + y dV$, where E lies under the plane $z = 1 + x + y$ and above the region in the xy plane bounded by $y = x^2$ and $y = 9$.
- $\int \int \int_E x^2 + y^2 dV$, where E lies under the plane $z = 6 + x + y$ and above the region in the xy plane bounded by the circle $y^2 + x^2 = 1$.

Problem 2. Use the triple integral to find the volume of the solid enclosed by the cylinder $x^2 + z^2 = 9$ and the planes $y + z = 5$ and $y = 1$.

Problem 3. Use the triple integral to find the mass of the solid enclosed by the cylinder $x^2 + z^2 = 9$ and the planes $y + z = 5$ and $y = 1$ with the density function $\rho(x, y, z) = x^2 + z^2$.