

Note: Final Exam is Tuesday of finals week. Project due last day of class. Complete the exam as a Malpe Lab

1. Consider the region R of the solid in the first octant bounded by the cylinder of radius one whose central axis is the z -axis and bounded above (a top) by the surface $z = 8xy$.
 - (a) Graph the region.
 - (b) Set up the integral to find the volume of the region R .
 - (c) Evaluate that integral.
 - (d) Evaluate the integral $\int \int \int_R z \, dV$
2. Consider the region R lying in the first octant and bounded by the paraboloid $z = 2 - x^2 - y^2$ and the cone $z = \sqrt{x^2 + y^2}$.
 - (a) Graph the region R
 - (b) Set up the integral to find the volume of the region R .
 - (c) Evaluate that integral.
 - (d) Evaluate the integral $\int \int \int_R (x^2 + y^2) \, dV$
3. Consider the region R lying in the first octant and inside the sphere $x^2 + y^2 + z^2 = 16$ and exterior to the sphere $x^2 + y^2 + z^2 = 1$.
 - (a) Graph the region R .
 - (b) Set up the integral to find the volume the region R .
 - (c) Evaluate that integral.
 - (d) Evaluate the integral $\int \int \int_R z \, dV$
4. Consider the region bounded by the cone whose angle in spherical coordinates is given by $\phi = \frac{\pi}{6}$ and a sphere of radius 1.
 - (a) Graph the region.
 - (b) Set up the integral to find the volume the region.
 - (c) Evaluate that integral.
 - (d) Evaluate the integral $\int \int \int_R (x^2 + y^2) \, dV$
5. Consider the region R of the solid in the first octant bounded by the planes $x + y + z = 1$ and $x + y + z/4 = 1$.
 - (a) Graph the region R .
 - (b) Set up the integral to find the volume the region of the region R .
 - (c) Evaluate that integral.