

Math 2415

Homework on 15.6

1. Sketch the region bounded by the following surfaces. Each pair of the surfaces intersects in a curve. Be sure to include these curves in your sketch. Then use a triple integral to calculate the volume of the solid.
 - (a) $z = 10 - x^2 - y^2$, $y = x^2$, $x = y^2$, $z = 0$
 - (b) $y + z = 4$, $y = 4 - x^2$, $y = 0$, $z = 0$.
2. Calculate $\iiint_E z \, dV$ where E is the solid region between the surfaces $z = y^2$ and $z = 8 - y^2$ for $-1 \leq x \leq 1$.
3. Sketch the solid, E , in the first octant that is bounded by the planes $x + 2z = 2$ and $2y + z = 4$. Calculate $\iiint_E z \, dV$.
4. Calculate $\iiint_E y \, dV$ where E is the solid bounded by the plane $z = y$, $z = 0$ and $y = 1 - \cos x$ with $0 \leq x \leq 2\pi$.
5. Find the volume of the region in the first octant bounded by the coordinate planes, the plane $x + z = 2$, and the parabolic cylinder $y = 9 - x^2$.