

MATH 251: In-Class Midterm

December 3, 2015

Name: _____ Sec: _____

1. Let \mathcal{D} be the region between the curves $y = 5 - x^2$ and $y = x^2 - 3$. Sketch the region and compute the integral of $f(x, y) = x^2$ over this region.

2. Compute the volume of the region \mathcal{R} sitting above the triangle bounded by $x = 0$, $y = 0$ and $y = 1 - x$ in the xy -plane, and between the planes, $x + y + z = 5$ and $2x + y + 3z = 6$.

3. Find the integral of $f(x, y, z) = x + z$ over the region inside the hemisphere of radius 4 where $y \geq 0$, and above the plane $z = 2$.