

MATH 264B Advanced Calculus, Winter 2006

Assignment 1, due in class on Thursday January 19, 2006

1. Compute the double integral

$$\iint_D x \sin y dA,$$

where D is the region of the plane bounded by the lines $y = x$, $y = -2x$ and $y = 3$.

2. Compute the double integral

$$\iint_D \frac{x + 2y}{3x - y} dx dy,$$

where D is the parallelogram given by $-2 \leq x + 2y \leq 1$ and $1 \leq 3x - y \leq 3$.

3. Compute the triple integral

$$\iiint_R f(x, y, z) dV,$$

where $f(x, y, z) = z$ and R is the region of three dimensional space defined by the inequalities $x + y + 3z \leq 1$, $x \geq 0$, $y \geq 0$, $z \geq 0$.

4. Compute the double integral

$$\iint_D x^2 dx dy,$$

where D is the region of the plane determined by the conditions $x^2 + y^2 \leq 1$, $x \leq y$.

5. Compute the triple integral

$$\iiint_R z dx dy dz$$

where R is the region within the cylinder $x^2 + y^2 = 1$, above the $X - Y$ plane, and below the cone $z = \sqrt{x^2 + y^2}$.