Fifth Examination
Thursday, November 12, 2009

Instructions: This exam should be done on your own paper. Your name should be on each sheet and on the back of the last sheet; the answers should appear written carefully and in order. If in doubt, show intermediate steps: Full credit may not be given, even for correct answers, unless work is arranged clearly and explained. This exam is closed book. You may leave after handing in your exam paper, but be sure to check your answers carefully. Each part of each problem is worth 25 points. You may keep this question sheet.

1. Compute
$$\int_{\mathcal{T}} \sin(x+y)dA,$$
   where $\mathcal{T}$ is the triangle with vertices $(0,0)$, $(0,\pi/2)$, and $(\pi/2,\pi/2)$.

2. Compute
$$\int_{\mathcal{D}} e^{x^2+y^2}dA,$$
   where $\mathcal{D}$ is the disk of radius 1 centered at $(0,0)$.

3. Write down
$$\int_{\mathcal{B}} xdV,$$
   where $\mathcal{B}$ is the ball of radius 1 centered at the origin. Explain why the answer is what it is.

4. Compute
$$\int_{\mathcal{C}} (x+y)^2 dV,$$
   where $\mathcal{C}$ is the cube of side length 1 with two of its vertices at $(0,0,0)$ and $(1,1,1)$.