MATH 126 B
Exam II
Autumn 2014

Name ______________________________

Student ID #________________ Section ________________

HONOR STATEMENT

"I affirm that my work upholds the highest standards of honesty and academic integrity at the University of Washington, and that I have neither given nor received any unauthorized assistance on this exam."

SIGNATURE:______________________________

1	10	
2	10	
3	10	
4	10	
5	10	
Total	50	

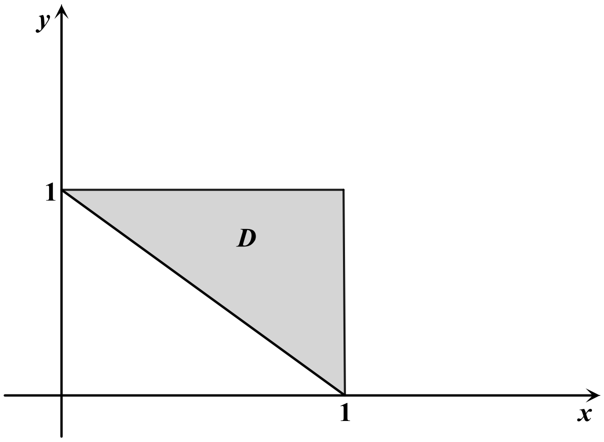
- Your exam should consist of this cover sheet, followed by 5 problems on 5 pages. Check that you have a complete exam.
- Pace yourself. You have 50 minutes to complete the exam and there are 5 pages. Try not to spend more than 10 minutes on each page.
- Unless otherwise indicated, show all your work and justify your answers.
- Unless otherwise indicated, your answers should be exact values rather than decimal approximations. (For example, $\frac{\pi}{4}$ is an exact answer and is preferable to its decimal approximation 0.7854.)
- You may use a scientific calculator and one 8.5×11-inch sheet of handwritten notes. All other electronic devices (including graphing and programmable calculators and calculators with calculus functions) are forbidden.
- You are not allowed to use scratch paper. If you need more room, use the back of the page and indicate to the reader that you have done so.
- The use of headphones or earbuds during the exam is not permitted.
- There are multiple versions of the exam, you have signed an honor statement, and cheating is a hassle for everyone involved. DO NOT CHEAT.
- You are not allowed to use your phone for any reason during this exam. Turn your phone off and put it away for the duration of the exam.

GOOD LUCK!

1. (10 points) Find the equation of the plane tangent to $f(x, y) = (4y^2 - x^2)e^{-x^2-y^2}$ at $(1, 1)$.

2. (10 points) A moving object has acceleration $\mathbf{a}(t) = \left(\cos \frac{t}{2}\right) \mathbf{k}$, initial velocity $\mathbf{v}(0) = \mathbf{i} - \mathbf{k}$, and initial position $\mathbf{r}(0) = \mathbf{i} + \mathbf{j}$. Find its position at time t.

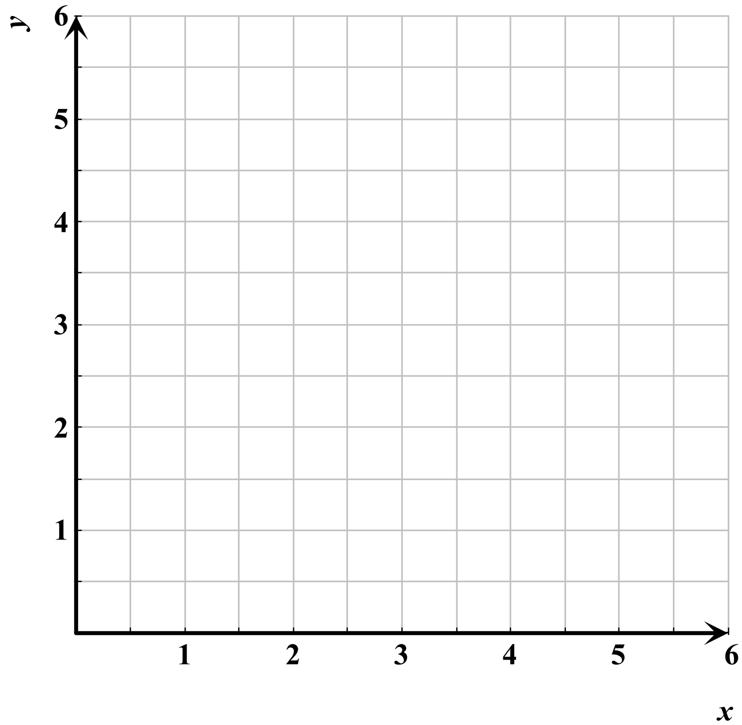
3. (10 points) Let D be the closed triangular region shown below. Find the absolute maximum and absolute minimum values of $f(x, y) = x^3 + x^2y + 2y^2 + 5$ on D.



4. (10 points) Suppose

$$\iint_D f(x,y)\,dA = \int_1^2 \int_y^{2y} f(x,y)\,dx\,dy.$$

Sketch and shade the region D on the axes below and reverse the order of integration.



5. (10 points) Let $D = \left\{(x,y) : x \geq 0, y \geq \frac{1}{2}, x^2 + y^2 \leq 1\right\}$ as in the figure below. A lamina in the shape of D has density

$$\rho(x,y) = \frac{18}{x^2 + y^2}.$$

The moment of the lamina about the x-axis is $M_x = \iint_D y\rho(x,y)\,dA$. Compute M_x. (SUGGESTION: Convert to polar coordinates.)