MATH 126 E
Exam II
Spring 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	16	
4	14	
Total	50	

- Your exam should consist of this cover sheet, followed by 4 problems. Check that you have a complete exam.
- Pace yourself. You have 50 minutes to complete the exam and there are 4 pages. Try not to spend more than 12.5 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.
- Turn your cell phone OFF and put it AWAY for the duration of the exam.

GOOD LUCK!

1. (10 points) Let C be the curve with parametric equations

$$x = \ln t, y = t^2 - 4, z = 3t - 15$$

and let P be the point at which C intersects the xy-plane. Find the equation of the normal plane to C at the point P. Write your answer in the form $Ax + By + Cz = D$.

2. (10 points) Use linear approximation to estimate the value of $8.03\sqrt{8.03 + \cos^2(0.04)}$.

3. (16 points) Find all critical points of

$$f(x, y) = y^3 + 6x^2y - 9x^2 - 3y^2.$$

Determine whether each point gives a local maximum, a local minimum, or a saddle point.

4. (14 points)

(a) Sketch the region of integration and change the order of integration.

$$\int_0^4 \int_y^{\sqrt{32-y^2}} h(x,y)\,dx\,dy.$$

(b) Convert to polar coordinates and evaluate the integral.

$$\int_0^4 \int_y^{\sqrt{32-y^2}} (x+y)\sqrt{x^2+y^2}\,dx\,dy.$$