

MATH 126 C  
Exam II  
Winter 2018

Student ID # \_\_\_\_\_

Name \_\_\_\_\_

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	6	
2	6	
3	12	
4	7	
5	7	
6	12	
Total	50	

- Your exam should consist of this cover sheet, followed by 6 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 about 12 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 **TI 30XII S** calculator and one 8.5×11-inch sheet of handwritten notes. **All other calculators, electronic devices, and sources 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. (6 points) Compute the partial derivatives  $\frac{\partial z}{\partial x}$  and  $\frac{\partial z}{\partial y}$  if

$$z = (x^2 + y)(\sin y^3).$$

2. (6 points) Find the point  $(x_0, y_0, z_0)$  at which the tangent plane to  $z = x^2 - y^2$  is parallel to the plane  $x + 5y - z = 10$ .

3. (12 points) Find the absolute maximum and minimum values of  $f(x, y) = 4x^2y$  on the set  $S = \{(x, y) \mid x^2 + y^2 \leq 1\}$ . (As always, show all your work.)

4. (7 points) Evaluate  $\iint_T x \, dA$  if  $T$  is the triangular region in the  $xy$ -plane with vertices at  $(1, 1)$ ,  $(1, 9)$ , and  $(5, 1)$ .

5. (7 points) Suppose  $f(x, y)$  is a continuous function and  $D$  is a region in the  $xy$ -plane such that

$$\iint_D f(x, y) \, dA = \int_0^{1/2} \int_{y^2}^{\sqrt{y/8}} f(x, y) \, dx \, dy.$$

Sketch and shade the region  $D$  and reverse the order of integration.

6. (12 points) Let  $R$  be the region in the first quadrant of the  $xy$ -plane bounded by the  $y$ -axis, the line  $y = x$ , the circle  $x^2 + y^2 = 4$ , and the circle  $x^2 + y^2 = 16$ .

Find the volume of the solid under the surface given by  $z = xy^3$  over  $R$ .